75c 8/3

MAY 1971

AMERICAN aircraft modeler

World's Biggest RC Show,
Toledo 1971-page 24

Best Prop Fighter?
Martin Baker M.B.5-page 16

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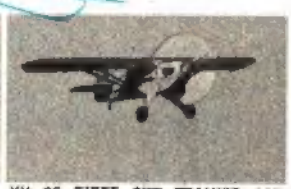

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COVER PHOTO: Colonel Hess, Chief Maintenance Officer for the President's 707, also likes slow antiques. He fully restored this beautiful 1930 Kinner-powered Fleet biplane. Ektachrome by Frank Pierce.

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straight and level

THE PROBLEMS OF PUBLICITY

ON RARE BUT FATEFUL OCCASIONS, the model airplane hobby is peculiarly plagued by distorted and destructive publicity in the nation's press. There was the time, for example, when, because of stories run by a miffed editor, two states actually barred gas models by legislation. Glue sniffing all but turned the hobby into a political football. Once again irresponsible newspaper stories exaggerate the dangers of model flying. Because of the serious nature of these reports, **AAM** *invited John Worth, Executive Director of the AMA, to review the situation. His comments follow below. Publisher*

Sometimes, no news is good news. With the bad news on TV and in the papers these days it's as though no one wants to print good news. Even when a story is approached with a friendly viewpoint, what the public sees may end up with a different slant. It's enough to discourage any sincere public relations effort on behalf of model aviation. A recent example points up the problem.

Last December, the *Los Angeles Times* had model aviation on the front page, including a fine picture of a model in flight. But the nature of the story was anything but helpful. Actually, the story wasn't so bad but the headline with it created a scare impression which overemphasized certain negative points. The headline claimed that model flying was a peril to the airways. Citing an incident involving a near-collision between a model and a helicopter, the story implied a generally bad situation which was being investigated by the Federal Aviation Administration with a view toward regulating model flying activities.

The story originated with a reporter who had contacted many sources–including the Academy of Model Aeronautics, the FAA, RC manufacturers, clubs–to get background information for what he indicated was to be a general interest article. It seemed like a golden opportunity for promotion, so all parties contributed information freely. Included was data concerning how high, fast, and far models have flown, an indication of the sophistication of today's models, as compared with the public image of stick and paper toy airplanes.

As published, however, the story suggested that, because models have flown at 200 mph and over 20,000 feet, they pose a serious hazard to full-scale aviation. This distortion resulted because the readers were not told that these were special flights made under special conditions, with FAA clearance where necessary, in sharp contrast to our normally lower and slower operations.

Unfortunately, the story was repeated in other newspapers around the country, as well as on radio and TV. Within a week of the initial publication, AMA headquarters received clippings from various local papers with the same report. The phone lines also were busy with friends of model aviation telling about the "bad press".

Aside from distortion, the big concern was what FAA reaction might be. The story had strongly hinted at the threat of arbitrarily imposed federal regulation. An immediate contact between AMA HQ and the FAA, within hours of the story's initial appearance, disclosed that FAA people were interested but similarly bothered by the nature of the story treatment. They had cooperated by providing information and also felt that the story had exaggerated the need for legislation.

To further cool off the situation, however, Headquarters forwarded to the FAA data which supported our position that model flying activities are already effectively self-regulated through AMA club and competition leadership. Friends within the FAA, when contacted for advice, reported that the present situation within FAA is calm and, hopefully, will stay that way. An important point is that, in 1962, the FAA studied model flying activities then decided that AMA's leadership strongly influenced modelers to fly safely, hence no legislation was necessary.

What will help, in the meantime, is for everyone to keep flying safely, especially if anywhere near the vicinity of full-scale aircraft. Any one incident in the present atmosphere could result in immediate and excessive attention from the press. Yesterday's headlines are quickly recalled if anything happens to refocus concern and undermine the record of safety to date. We dare not relax our efforts to maintain and improve that record.

Meanwhile the cloud has a silver lining. Because today's media atmosphere seems to emphasize only the negative aspects of the news, a scare story was shrugged off. It didn't do much more than annoy, despite a frightening headline on the front page. No real or lasting harm seems to have been done.

We are left, however, with a publicity problem. In attempting to promote model aviation, we find that the press pledge to "tell it like it is" is being twisted into something else. It makes for a tough public relations job and a real challenge, but we shouldn't be too discouraged. The truth is that model flying is a healthy, growing and responsible activity. That fact must eventually emerge and be recognized.

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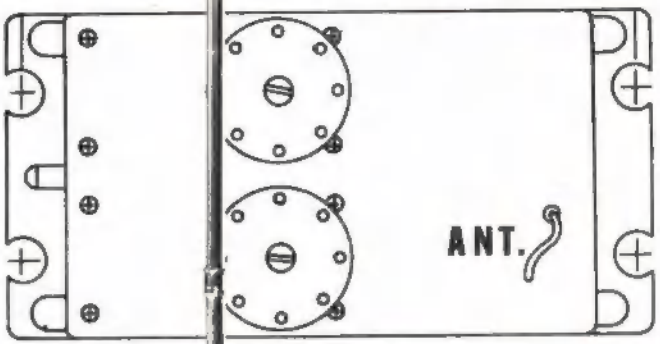

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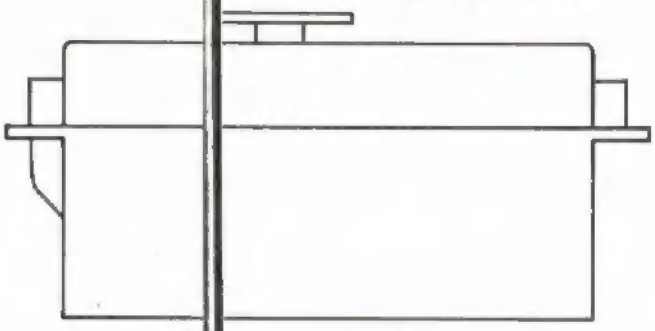

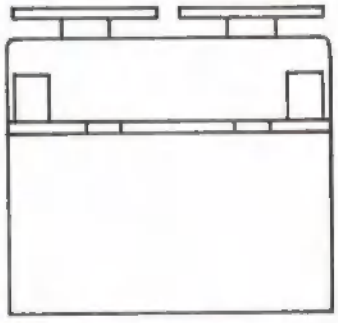

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modeler mail

Emphasize sport!

American Aircraft Modeler has the broadest coverage of any magazine today; the Tenderfoot articles are great—as are your editorials. However, I feel that a little more emphasis could be placed on the sport flier. After all, he is the one who holds our hobby together.

In my younger days, I worked in several hobby shops in the South Jersey-Philadelphia area and, even though I am an active contest flier, I must admit that we had very few contest fliers as customers in an area quite competitively active.

I think RC has initiated an unwarranted takeover of our magazines. How many of us have seen someone out flying an RC job as compared to some kid stirring up the dust with a 1/2A control line plane? RC has a strong enough foothold on the hobby and doesn't need all that much help from the publications; whereas the old standbys, FF and CL, are slowly dying out.

In closing, I'd like to make a few constructive suggestions. How about a "Getting Started in FF (or CL)" series, also more designs that the average modeler won't be afraid to tackle (not beginners, but somewhere in between), and maybe some sport FF?

James Smith, Marlton, N. J.

Silent silencer?

Granted, our engines are fine and perform wonderfully; but when it comes to our mufflers, something is left to be desired. How often I stare in amazement, wondering how a small bit of metal can make such a racket.

So, how about the poor souls who live in congested areas and cannot even break in an engine without the neighbors slamming windows and dogs wailing? Surely some manufacturer can make a more silent silencer—no matter what the weight—so we can at least run our engines until we can get to the country and fly our joys!

Joseph Chalupowski, Salem, Mass.

What's left of FF?

As an oldtimer (I go back to 1938, when my first engine was a Brown Model D), I remember when we flew free flights "by the seats of our pants." However, I was indeed fortunate and won the State Championship in Connecticut in 1948, was second in 1949, and won it again in 1950.

Unfortunately, I have not been active in modeling in the last 15 years, but have begun to come back strong since last winter. Having built several free flights, including two oldtimers with ignition and having attended several meets here in the mid-South, I am finding the old enjoyment.

I guess I must be in the dark ages, however; when I picked up the February issue of **AAM**, it made me wonder how much fun there is left in flying when free flighters have to use thermal detectors, electric starters and tachometers in competition. I'd like to hear how other free flighters feel, but certainly want to go on record for outlawing such devices.

T.A. Cimino, 981 June Rd.
Memphis, Tenn.

History on Natter

Concerning Bob Woods' letter in February's "You Said It": one of the best sources for information on the Natter, as well as other planes of the Luftwaffe, is William Green's *Warplanes of the Third Reich*, Doubleday, 1970.

The fate of the man who volunteered to pilot the Natter's ill-fated launching is recorded by Green as follows:

"On Feb. 28 [1945] Oberleutnant Lothar Siebert, who had volunteered to perform the first fully-powered flight trials, was launched in a Ba 349. The aircraft climbed to an altitude of approximately 1650 feet when the cockpit canopy suddenly detached itself, the aircraft turning over on its back and continuing to climb at a shallow angle to an altitude of some 4800 feet, then nosing down and diving into the ground, exploding on impact.

Subsequent investigation never furnished an entirely satisfactory explanation for the accident, but it was assumed that the canopy had not been properly locked prior to takeoff and that Siebert had been knocked out."

Patrick Potega, Madison, Wisc.

Needle needed

I have a problem which you don't run across every day: I have an OK Cub 049 engine with a Venturi type system, but no needle valve for it. I would appreciate it if a reader who has an extra one he is willing to sell would notify me.

Terry Burich, 855 Ash St.
Hutchinson, Minn.

Back to free flight

I wish to compliment you on publishing a fine magazine. The articles make interesting reading anytime I pick up a current or back issue, which I keep for reference purposes.

I'd like to see an article sometime on how to make those wire spoke wheels which many of the old scale models are equipped with. Perhaps a manufacturer could put up a kit.

I have been building and flying off and on since 1937, and really like free flight rubber, gas and sailplane modeling best. Perhaps a reader can help me. I am presently looking for a club in New Jersey that engages primarily in free flight activities. I always enjoyed seeing my creation fly off on its own (for better or worse) and return, often for many more graceful, unhurried flights. I have saved the plans from some of my old favorites and am about to obtain additional plans for other oldtimers. Now, if I can find a suitable club where others do this kind of thing, it will be much more enjoyable.

Edgar Pfarre, 37 Knollwood Ave.,
Madison, N. J. 07940

Readers interested in contacting nearby clubs should write AMA headquarters, which has a listing of many hundreds of clubs according to their specialities.
—Publisher.

A need for fun events

I read with interest the Straight and Level (Feb. **AAM**) article regarding adding some new and fun events at the Nats. Seems as though the fun events left us when Jim Walker passed away. I can still remember the Ceiling Walker events held in a parking lot at the Fort Shelby Hotel in Detroit during the great Plymouth Internats, and the A. J. Hornets flying around the hangers at the Nats. I guess something is missing.

Your mention of static scale at the Nats also brought back some thoughts. Eight years ago in Chicago, a committee was formed to include just such an event to be held during Nats week. The AMA and Smithsonian were both involved in this planning and then nothing followed.

If memory serves me, the winning models were to be shown in the National Air Museum at the Smithsonian. I think this would be a great program to pick up. If you've ever been to the National Model Plane and Space Show held each spring in Cleveland you'll know what I mean. Hundreds of scale models are shown, many of them UC models. By looking at them you know they won't fly, but the workmanship is fabulous.

J. C. Smith, Massillon, Ohio

Readers can offer hints

I have been rough-wood modeling for about a year now, and am very much a beginner.

This year in school, my friends and myself want to start a modeling club. We're all about 15 and all beginners. My reason for writing is

(Continued on page 10)

Curtis Dyna-Products Corporation has, for 25 years, been associated with the aircraft industry through its engineering and design of aircraft components and hardware. Now, utilizing this engineering talent Curtis Dyna-Products is rapidly becoming a major factor in the hobby industry. Through its Citizen-Ship division, by manufacturing the best in radio control electronics for use with R/C Race cars, airplanes, and R/C Boats; through its other divisions the famous Dyna-Jet for use in Jet cars, Jet airplanes, and Jet boats; the famous Curtis-Cars, both Can Am and Indy types; the Curtis manufactured hobby equipment is leading the way. If you want the tops in R/C Equipment, R/C Race Cars, Jet Engines, or Race Car Parts write or call the Citizen-Ship Division, of Curtis Dyna-Products Corporation today. Our address is P.O. Box 297, Westfield, Indiana, and our area code is 317, Phone number 896-2561. Catalog available on request. please!

Citizen-Ship Radio

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(Modeler Mail continued from page 8)

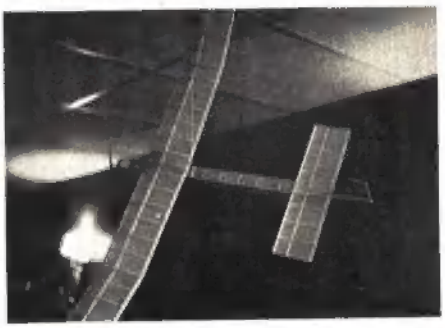
to ask help from the readers of AAM in starting our club. Our emphasis will be mostly on rubber, free flight and control line. Any tips on kinds of contests and just running the club will be appreciated.

Steve Lowry, R.R. 2, Lakeville, Minn. 55044

The Academy of Model Aeronautics has information on starting and running a club and stands ready to lend advice on such matters. —Publisher.

Loves those Tenderfoot projects

In the December issue of AAM there appeared an article about the Sundancer. Enclosed are two pictures of the aircraft: one built by a fifth grader, the other by an eighteen-year-old. The former is built according to the plans, covered with tissue, and weighs 1 1/2 oz. The latter is covered with MonoKote. Other modifications brought its weight to 2 oz.



We have made every airplane that has appeared in the "For the Tenderfoot" series and enjoy them very much. Most have required some modification to get them into the air—which is why we build in the first place. Also enclosed is a picture of some of our Tenderfoot planes. Can you identify them?

Paul Harker, Kewanee, Ill.

WE CARE ENOUGH TO SELL THE VERY BEST

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ON THE SCENE

by DON LOWE

TANGERINE INTERNATIONAL RC

THE TANGERINE INTERNATIONALS RC Meet is held each year, between Christmas and New Year, at Orlando, Fla. This event is particularly enjoyable for us Northerners who can escape from wintry blasts while combining fine model competition with Florida's many other pleasures. This year, CD Walt Schoonard and his capable colleagues from the Remote Control Association of Central Florida RC Club hosted 71 contestants and packed a lot of flying into three days.

Three Pattern events and two Pylon events were part of the activities. Pylon is quite popular down south, so the total Formula I entry included 38 aircraft. Open Pylon, held according to AMA rules on engine displacement, wing area and thickness, was also popular.

Pattern events had an even distribution of 16 entries each in Classes A, B, and D. Formula I elimination heats were held to bring the entry down to 20 finalists. Each contestant was given five preliminary heats and the top 20 received five additional final heats—plenty of flying for all.

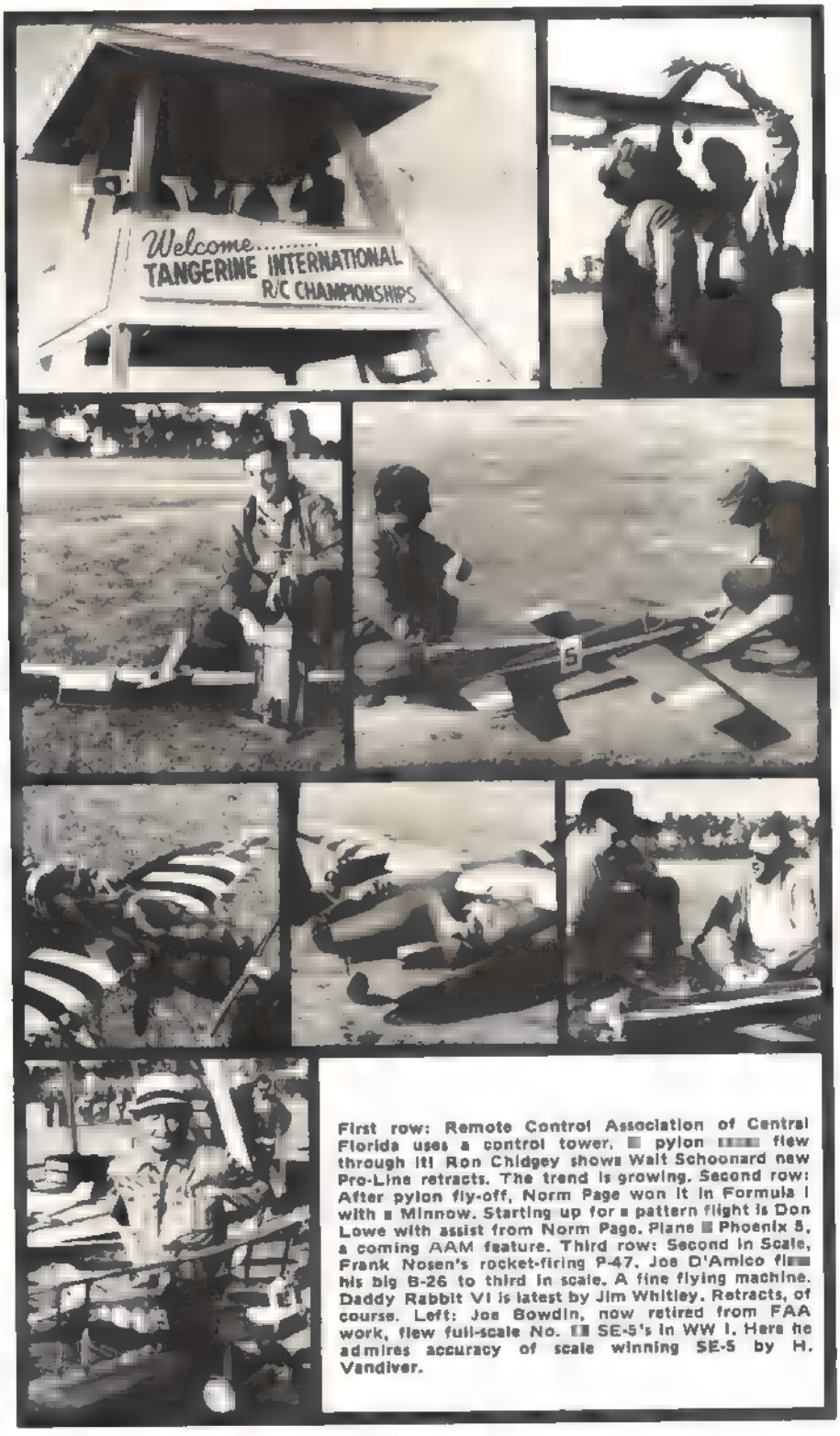
Times were good, with several in the 1:40's, and the best time going to Lou Penrod at 1:40 even. Competition was fierce. Approximately half of the 38 planes entered hit the dust for one reason or another—two mid-airs, equipment failure, pilot failure, etc.

Open Pylon saw some good times, with several in the 1:40's. All entries use Pattern-type ships except for the special racing craft entered by Mike Barna, who was the eventual winner with a best time of 1:42. This same ship design has turned a record 1:33 with Bob Smith at the controls. Some Pattern ships really moved with Supertigre G60 ABC's. No garden variety Pattern ship can compete against special racing craft and engines to win Open Pylon these days.

Controls required for Open Pylon were given a lot of discussion. There seemed to be much sympathy for enforcing the Pattern ship requirement, although it is difficult to reach an acceptable agreement on its definition. Some (including the author) felt a throttling and taxi demonstration, plus a requirement to perform one or more pattern maneuvers to be specified by the contest director, was a good approach. Most agree that the all-out Open ships are great but are in a class by themselves. There is still much interest, however, in a racing event for the Pattern-type ships, thus serving the original intent that it be a fun event for Pattern flyers.

One profound lesson to be learned from these racing events is that more stringent observance of safety rules must be practiced. The confines of the Tangerine Meet's field made it difficult to provide adequate

(Continued on page 72)



First row: Remote Control Association of Central Florida uses a control tower. ■ pylon ■■■■ flew through it! Ron Chidgey shows Walt Schoonard new Pro-Line retracts. The trend is growing. Second row: After pylon fly-off, Norm Page won it in Formula I with a Minnow. Starting up for a pattern flight is Don Lowe with assist from Norm Page. Plane ■ Phoenix 5, a coming AAM feature. Third row: Second in Scale, Frank Nosen's rocket-firing P-47. Joe D'Amico flies his big B-26 to third in scale. A fine flying machine. Daddy Rabbit VI is latest by Jim Whitley. Retracts, of course. Left: Joe Bowdin, now retired from FAA work, flew full-scale No. ■■ SE-5's in WW I. Here he admires accuracy of scale winning SE-5 by H. Vandiver.

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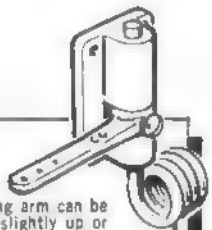


STEERABLE NOSE GEAR

Versatile — steering arm can be to either side, slightly up or down, or mounted on bottom with extra collar in slot. Steering arm is nylon, stiff enough for good control, yet can flex under shock to protect servo. Collar is hardened steel — won't strip like brass. Screw is hardened steel, too. You can really torque it and get good grip on music wire strut without a flat. Try it, you won't get it to strip out easily.

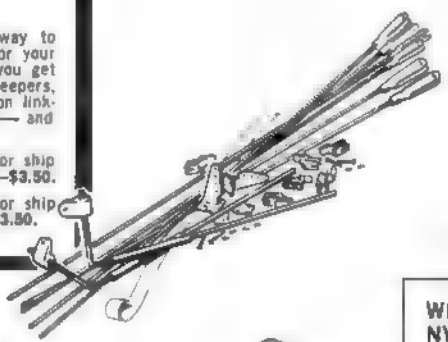
Complete steerable gear, with nylon bearing, 5/32" plated music wire strut, extra collar, blind nuts, screws and washers—**$2.50.**

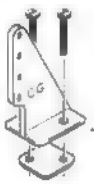
NEW—MAJOR R/C FITTINGS SETS

Here's the economical way to buy the major fittings for your multi ship. In one set, you get all the horns, links, keepers, bellcranks, or strip aileron linkage, and hinge material — and at a saving.

R/C Fittings Set No. 1 for ship with standard ailerons—**$3.50.**

R/C Fittings Set No. 2 for ship with strip ailerons—**$3.50.**



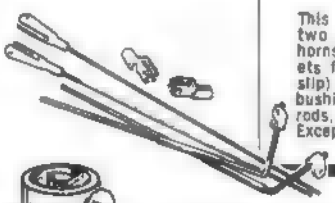


CONTROL HORNS

Our new horns have the upright part rising from the center of the base for maximum stability. Holes are right size for 1/16" wire; nut plate for simplest mounting. Long horns or short horns, with screws — **50¢ for 2.**

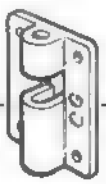
WIDE NYLON TAPE

This nylon reinforcing tape is extremely tough when applied with cement around the center when joining wing halves. 2½" wide x 5 ft. — **50¢**



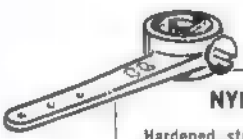
STRIP AILERON LINKAGE

This complete set has two threaded aileron horns; two nylon brackets for fine, safe (can't slip) adjustment; brass bushings; Snap-Links and rods, and Snap'R Keepers. Exceptional value—**$1.50**



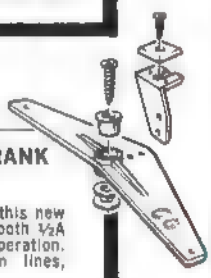
NYLON BEARING

One-piece design mounts to firewall without alignment problems. Includes blind nuts, screws and washers — **75¢**



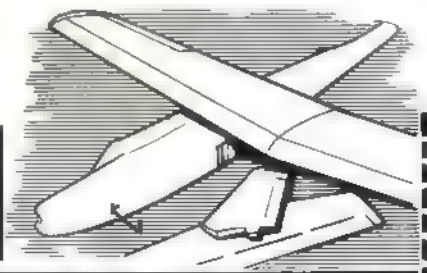
NYLON STEERING ARM

Hardened steel collar and screw — **75¢**



½A BELLCRANK and HORN

Made of nylon, this new set provides smooth ½A control line operation. Easy dacron lines, too, **25¢.**



REPLACEMENT FOAM WINGS, ETC.

To go with your design fuselage. Proven efficient Ranger 42 foam wing gets you in the air quickly. $3.95. Stab and vertical fin, set $1.95. Assembled Ranger 42 fuselage, plus bearers, nosegear, etc., **$8.95.**

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I am sending 10¢ for 4 pg. Illustrated Catalog with "Recommendations on Starting in R/C," Basic Explanation of R/C Equipment, and Radio Control Definitions.

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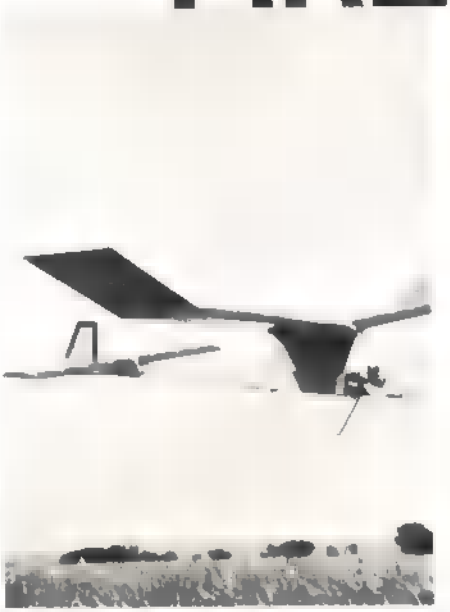
FIRE WAGON

by JAMES CLEM



MOST MODELERS HAVE definite ideas as to what features constitute the ideal contest model. Some prefer larger, lightweight ships with the accent on glide. Others like small hot ships that practically disappear from sight at the top of a 15-second engine run. Some prefer high-thrust, others like low-thrust. Some like rudders on bottom, some prefer rudders on top. The features and combinations are endless. This is one reason why free flight is so interesting.

Once, I was excited about a new design of mine which had just won first place in heavy competition. It did not occur to me that any airplane, including a barn door, would have done just as well had it been in the same three thermals. Years of contest flying have convinced me that the modeler who wins consistently is the one who spends many hours test flying in order to trim his airplane properly. A superior design is no guarantee of superior performance. The margin lies in one's ability to get the most out of the machine he's flying. The 1/2A Fire Wagon incorporates certain design features which insure excellent performance provided the builder follows the building instructions, trims the airplane properly, and avoids downdrafts.

The Fire Wagon falls within the small hot category. Its wing area is just under 250 sq. in., projected. With a hot 049 or 051 engine, it's a potent contest machine. With an 049 salvaged from a plastic model, it's just right for sport flying. One important feature is its ease of construction. This airplane was designed on the theory that a model does not have to be complicated and difficult to build to be an excellent performer.

Design features include an aft rudder for climb stability under high power. Most of the rudder is actually below the thrust line, which puts the vertical fin in the right side blast of the prop, giving the model a right power turn. This arrangement plays an important part in the transition. The left adjustments (stab tilt and washout in the left wing tip) cause the model to turn left in the glide. The prop wash overpowers the left tendency, producing a right power climb. When the engine stops, the left-turn forces take over, causing the plane to turn sharply to the left. This results in a smooth transition without loss of altitude.

Whether an expert or beginner, the modeler will enjoy building and flying the Fire Wagon. It's as simple as it looks and it flies as easily as it goes together. Select only lightweight contest balsa if the airplane is to be used for contest flying.

Construction

Fuselage: Cut out the fuselage sides, rudder and pylon. Preglue Pylon and rudder edges before assembly. Cut out the fuselage bulkheads. Pin the fuselage sides in place on the top view of plan and cement the bulkheads in place. Install bulkhead No. 6 after the rudder is installed. Cement the pylon in place and make sure that pylon and rudder are in perfect alignment. Install blind mounting nuts to the plywood firewall and glue firewall to bulkhead No. 1. The plans show a Tatone metal tank-mount. If a Cox plastic tank-mount is preferred, blind mounting nuts will not be needed. However, it may be necessary to add some weight to the plastic tank for proper balance.

Cover the top and bottom of the fuselage with 1/16" sheet and add the plywood stabilizer mount, stabilizer stop and 1/8" dowel. Install the DT setup as shown. Position the limit wire guide at a point on the fuselage which permits the stabilizer to pop up at about a 45-degree angle. The hook must not pass through the eye of the guide. This controls the amount of travel of the limit wire.

Install the wing mount and the sub-rudder. Apply gauze or nylon to the front end to help secure the firewall firmly to the fuselage. Use epoxy for this job. Sand the fuselage well and cover with Jap tissue. Apply five or six coats of thinned fuel-proof dope.

Wing: Cut out the wing ribs and sand well. Notch the trailing edge as shown and pin the leading and trailing edges to the plan. Place a piece of 1/16" thick balsa under the tip of the outer left wing panel in order to build in washout. Trim each rib to fit, removing any excess balsa from the trailing edge end of the rib. Place the main spar over plan and cement the ribs in place. Cement wing tip ribs (WT) in place at the angle shown and add scrap wedges.

After the wing is dry, remove it from the plan and add dihedral braces and join wing panels together. Measure dihedral carefully to correspond with dimensions shown on the plan. Add straight ribs, notching them to fit over the spar overlap. Permit the wing to dry and cement top spars in place. Trim and sand the wing carefully. The leading edge should be sharp-edged as shown on the rib pattern. Give the leading and trailing edges a coat of dope and cover the wing with Jap tissue. Give the wing five or six coats of thinned dope and cement the wing, locating keys (split dowels), in place.

Stabilizer: Stabilizer construction is generally the same as for the wing, other than the notches in the trailing edge. The washer shown provides a hole for the DT limit wire.

Left: Lightweight construction gives great gliding ability. Rides slightest thermals.

Center: Most of rudder is below prop wash because of downthrust. Good climb control.

Right: Quickest way up is from VTO. Launch with wind to your back. Author shows how.

When installing the limit wire, pass it through the trailing edge and solder a small loop at the end to prevent the wire from passing back through the washer.

Flying

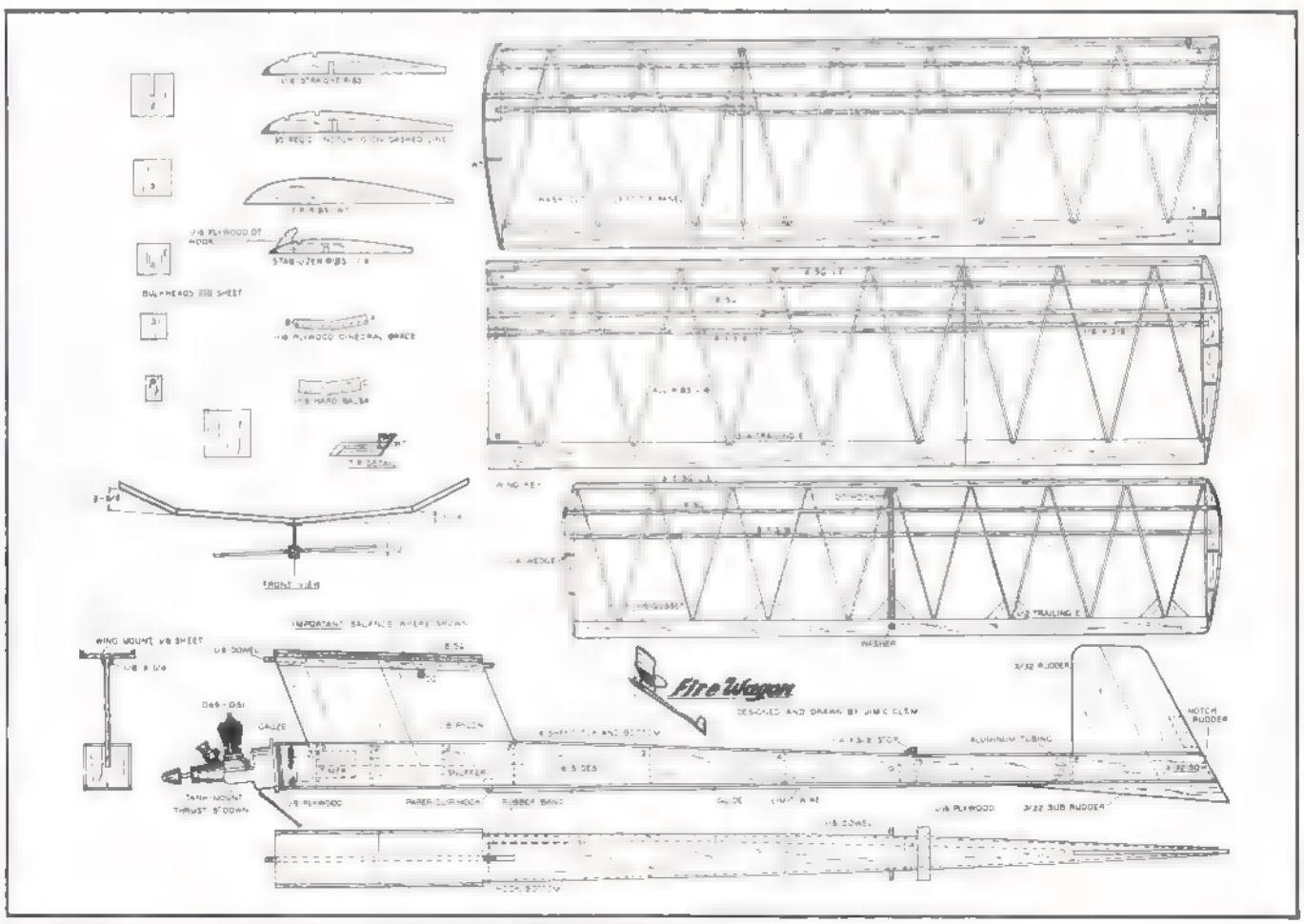
Hand-glide the model several times with left-turn stab tilt as shown on the plans. If the model stalls, add 1/32" scrap balsa under the leading edge of the stabilizer until corrected. If the plane has a diving tendency, add the balsa under the trailing edge of the stabilizer until a flat glide (just on the verge of a stall) is obtained. The glide circle should be approximately 80 to 90 feet in diameter. The relatively tight turn is important to the transition and it also keeps the speed up. This causes the wing to create more lift.

When satisfied with the glide, give the plane a short power flight. Set the timer for five seconds with the engine running about two-thirds power. It should turn to the right with the nose up at about a 30-degree angle. If it turns too sharply to the right and gains little altitude, turn the rudder tab very, very slightly to the left (about 1/64"). If the ship has a looping tendency with no right turn (which is most unlikely) use a very small amount of right rudder tab.

The transition from power to glide may not be perfect until full power is added. At full power there should be no loss of altitude when the engine stops.

If the plane has the five degrees' downthrust as shown on the plans it should not be necessary to change the thrust line in order to make power adjustments. Changing the thrust line will affect the power turn. If the Fire Wagon climbs at less than a 45-degree angle under full power, add negative incidence to the stabilizer until the proper angle of climb is obtained. Additional stab tilt will eliminate any stalling tendency in the glide due to increased incidence.

The model should climb to the right at about a 45-degree angle. When the engine stops, it should swing to the left into a flat glide. Take plenty of time to adjust the Fire Wagon properly and it will be a winner. It is important that it be balanced at the CG location shown on the plan.



FULL SIZE PLANS AVAILABLE—SEE PAGE 70

GREATEST PROP FIGHTER?

Dimensions
th—37' 9"
an—35' 0"
Height—
Wing Are—263 sq. ft.
4233 lb.
Maximum Weig 12090 lb.

Performance
Maximum 460 mph at
Initial Rate of Climb—3800 fpm
Maximum Range—1100 mi.
Service

Test-flown just two months before the Gloster Meteor jets went into R.A.F. service, the Martin-Baker M.B.5 promised much, but Whittle's invention took away its glory.

by DON BERLINER

OF ALL THE GREAT technical advances in the history of aviation, probably none has had the impact of the jet engine. In just a few years, it doubled speeds and ceilings and quickly thereafter doubled the airplane's load and range. In most of aviation, propellers are a thing of the past. The jet engine was, without a doubt, a genuine revolution.

But is there a wind that blows all good? When the hot blast of the turbojet swept the skies of piston engines at the close of World War II, it left in its wake some airplanes that might have become great, had the times been a little different. There was the Republic P-72, a 490-mph development of the P-47 Thunderbolt. And the Supermarine Spiteful, which was a super-Spitfire capable of 494 mph at altitude. And the Focke-Wulf Ta-152, a super Fw-190 good for over 460 mph.

And then there was the Martin-Baker M.B.5. Like the others, it was poised at the end of the runway, waiting for clearance, when the strange-looking thing without a propeller swooshed by. All the important people, who could have played an important part in putting the M.B.5 into production and showing the world the finest piston-engined fighter of all, suddenly lost interest. Here was a new standard of sleekness and glamour but, too bad, because the old must make way for the new.

But what of this Martin-Baker thing? For that matter, what of any Martin-Baker airplanes? Their ejection seats are world famous, having saved the lives of an estimated 2800 pilots. But this small British firm, which, in 1929, started out to build airplanes, turned out a grand total of four in more than 40 years in business.

The first was a two-seat, low-wing,

fixed-gear lightplane built in 1935 and lost in a shop fire after a brief but promising life. Next came the M.B.2, a prototype fighter unveiled in May, 1939, as World War II approached and new designs were desperately needed. Despite its fixed landing gear, it was faster than the Hawker Hurricane and almost as fast as the Spitfire. And it was designed to be built rapidly by semiskilled workers at relatively low cost, which should have made it very appealing to a country that needed a lot of airplanes in a hurry. But while the Hurricane and Spitfire went into mass production and history, the M.B.2 went to the scrap heap.

The flamboyant Jimmy Martin and his partner and chief pilot, Capt. V. H. Baker, plowed ahead. Their next brainchild was the M.B.3 and it was ■ beauty. With a 2000-hp, 24-cylinder Napier Sabre engine and no fewer than six 20-mm cannon in the wings, it first flew on Aug. 31,1942, and seemed headed for production. It was good for 415 mph at 20,000 feet and had outstanding maneuverability and ease of control. Unfortunately, less than two weeks after its first flight, ■ dead-stick landing went awry and the resulting crash killed Capt. Baker and demolished the M.B.3.

In peacetime, such a blow to a small company and its prospects might have been too much. But the war was going full-bore, and there was little time for mourning. The M.B.3 was obviously a good airplane, and so Jimmy Martin went back to work, changing the engine to a 2200-hp Rolls Royce Griffon V-12 and calling it the M.B.4. The idea looked good, but it was dropped before ■ prototype was built, and the M.B.5 took its place.

This one was basically similar to the M.B.3 but cleaned-up and modernized and powered by a 2340-hp Rolls Royce Griffon 83 driving a six-bladed contra-rotating propeller. Armament ■■■ down to just four 20-mm cannon, but speed was 'way up. The prototype was test-hopped on May 23, 1944, and quickly became known as an outstanding airplane. Unfortunately, at least for Martin-Baker, the first Gloster Meteor jets were delivered to an RAF squadron less than two months later.

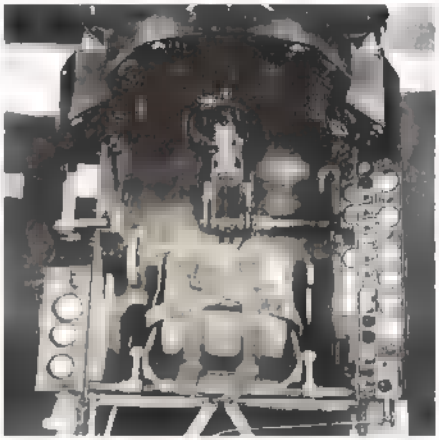
Thus, despite the M.B.5's excellent qualifications, the game had changed and it was forced to sit on the bench while the awkward, but awfully fast, jets ran with the ball. Had the M.B.5 come along earlier, or had the jets come along later, aviation history might have been full of praise for the Mustang-like speedster from Denham, near London. It had everything but timeliness. The result was something like oblivion.

But it was, without ■ doubt, quite an airplane. Many have called it the extreme limit of piston-engined fighter development. Among the many rave reviews it received were these words from A. S. Wolff, Assistant Chief Designer of North American Aviation, who inspected its immediate predecessor, the M.B.3, and reported ■■ the War Department in Washington:

"From a maintenance and operation standpoint. . .the (M.B.3) presents ease of inspection, replacement of components and repair in the field due to failure or enemy action unparalleled ■■ any fighter type aircraft (existing) today (April, 1942). With few exceptions, the aforesaid maintenance items could be performed by extremely unskilled men, with a (minimum) of special tools. . . It is (my) belief. . .that from this consideration alone, the project presents such worthwhile elements, that the dissemination of the information concerning these factors to designers. . .both in the United Kingdom and America, would be of untold benefit to the joint war effort."

The report concluded, "It is Mr. Wolff's opinion that. . . .the many design innovations (such as armament, powerplant, etc.) warrant immediate attention and analysis. . .for ultimate incorporation in all service aircraft." He elaborated, "The landing gear presents a most unusual and practical design; its extreme simplicity of location, fabrication and assembly, coupled with its ingenious mechanical characteristics, render it a very valuable development, and should be studied with ■ view to incorporation into all aircraft utilizing retractable gear." ". . .by far the simplest powerplant installation which I have ever seen." "The armament installation presents an ease of production and assembly which is unparalleled ■■ (my) experience."

Since airplanes have to be built and then repaired, these qualities are certainly important; moreover, the lack of them has doomed many an otherwise great airplane. But ease of maintenance doesn't mean much if the airplane is ■ dog. Only one M.B.5 was built, and so not many people got a chance to fly it, but it appears that no one who ever



Top, left: So simple and advanced was the landing gear design that serious consideration was given to incorporating it into all craft requiring retractable gear. Ease of service in general, plus many ingenious design innovations put this fighter ahead of any then in service. Left: Junction of the air intake/fuselage was neatly streamlined. Above: The cockpit and instrumentation also were of an advanced order. While well-equipped, it gave ■ feeling of simplicity—which would have increased a pilot's composure.

flew it will forget the experience. To R. G. Worcester, who tested it long after it became obsolete, it bore similarities to the Spitfire, which is the ultimate in praise from a British pilot.

". . .the instruments are placed rather low and. . .are all easily readable. Taxiing is easy. . . . Initial acceleration is tremendous. . .and there is no tendency to swing. . .(the crosswind) had no effect whatever. Lateral stability is good. Even with the contra-prop in fine pitch, the vibration is much less than usual for a fighter. Forward view is so good that the impression of an unusually steep nose-down attitude is formed on the approach for a normal landing. Taken all 'round, this is a highly maneuverable aircraft, the controls respond finely, like those of the Spitfire. . . . The atmosphere in this aircraft was thoroughly 'likeable' and there was a feeling of security in the knowledge that it has an enormously strong structure."

The highlight of its otherwise unsatisfying career probably came during the 1946 Farnborough Air Show, when the late Polish aerobatic ace, Jan Zurakowski, put it through a routine they still talk about. Not long after, the trail grew cold. The M.B.5 was used briefly as ■ test-bed for the contra-rotating prop, but nothing more is known.

Yet, it could hardly have disappeared without a trace, as it seems to have done. As a matter of fact, ■ recent letter from a spokesman for Sir James Martin ends with this tantalizing remark: ". . .but we understand that it was purchased by an American, and recently we were told that it was still flying somewhere in the U.S.A." But where?

PLATYPUS

by Roland G. Bernier

An aerobatic seaplane is unique. Foam construction for quick building and fail-safe buoyancy.

THE PLATYPUS IS the fulfillment of an ambition, after three years of frustration.

Although I had flown RC for ten years, my interest in flying off water began in 1966 at the first NERCM Hydro Meet, Brimfield Dam, Brimfield, Mass. I installed a set of floats on an Aeromaster and spent the day trying to get it off. These efforts made the cover of *Flying Models* (Jan. 1967), but the caption indicated that the Aeromaster didn't quite make it.

The challenge now was greater but I didn't fare much better the next year. The ship managed to get into the air, but that was about all.

In 1968, I installed a set of floats on a Kwik-Fli II and put in some practice flights. Back at Brimfield in September, radio trouble on the first flight resulted in a semi-controlled crash on the lake shore! The second day of the meet, I returned with the repaired, hopefully flyable, airplane. The radio worked fine, but the ship flew poorly, apparently due to misaligned floats, a result of the previous day's damage. So much for 1968.

During these round trips to Brimfield, I noticed that flying boats had much better water handling characteristics than float type planes but were much less aerobatic. So why not build a flying boat which was as clean and aerobatic as the land-based hot multis?

The Platypus was designed around this idea. A low- to midwing provides equal (if possible) distribution of weight and lateral area, above and below the wing. Having the wing near the water eliminates struts, since tip floats always seem to come off the usual flying boats. A low profile gives better water handling characteristics, especially in crosswind taxiing.

A short, wide, and concave hull provides fast planing, with minimum spray, for quick takeoffs and keeps the profile low. The upper and lower angle of the hull are equal to minimize air effects and to prevent hunting in the flight angle of the plane changes. A high step gives easy release from the water and a five-degree aft fuselage angle allows rotation for takeoff.

An NACA 2415 airfoil provides good wind penetration, excellent stall characteristics and low drag, coupled with a low aspect ratio (5 to 1) and plenty of wing area for low wing loading. Zero-zero incidence gives fast, groovy flying. Moments and area are those standard to normal multi-stunt planes. Plenty of foam is used for water integrity.

All these ideas were great, but would they work? This was my first plane completely designed and built from scratch. The first test hops were from hand launch and the ship flew right off the board. To have it perform that well the first time was most satisfying.

The next step was water tests. Taxi tests indicated that the buoyancy factor was cut too close. When the ship went from standstill to flying speed as the throttle was opened, water came up over the nose and killed the engine. However, if the plane were held when the throttle was opened and then released, it got up on the step immediately and took off.

The first flight was routine until the landing—a collision with a boat dock support. Result, sheared wing and no hobby shop within 50 miles (we were on vacation in northern Vermont). The foam wing came in handy. It was repaired with epoxy, pieces of foam from a portable radio package, and several balsa wings from ten-cent gliders. The

Author holds a much-flown Platypus. Note large stabilizer to compensate for wide bow area and neatly cowled engine.

MonoKote then was ironed back on and the plane was ready to fly.

Further tests and flights indicated a modification of the hull was definitely required. After alterations, a test hop was made the week before the 1969 Brimfield meet. The plane flew great until a wire let go in the elevator servo. Net result, several pieces of fuselage and another broken wing. Back to the workbench and then another test hop the night before the contest. Fuel line trouble developed. By the time that was remedied, it was too dark to fly! So off I went to Brimfield, with an untested plane.

The day of the contest was beautiful—a light wind, slight chop, perfect for flying—and I finally had time for a check flight. And then, at last, I won first place in the flying boat class! The Platypus, with both excellent water handling and flying characteristics, was a breakthrough toward high performance seaplanes.

Construction

The fuselage is made in two sections: the foam hull and the main fuselage-nacelle structure.

Hull: Formers 1 and 2 of 1/4" ply are used as the pattern. Mark the fuselage opening of F2 but do not cut it out at this time. A four-inch thick block of foam is required. (I used blue styrofoam, but white beaded foam should work as well.) Use small nails through pre-drilled holes to pin F2 at one end of the block. Be sure it is squared and centered. Now, carefully center F1, both vertically and horizontally, at the other end of the block.

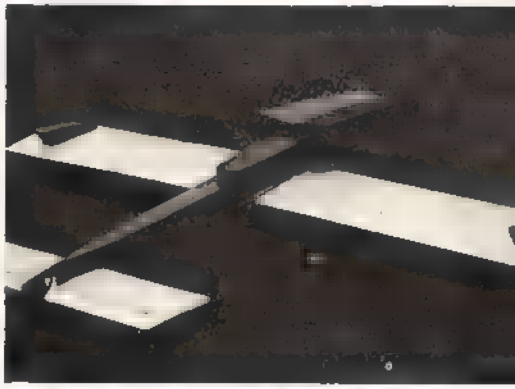
The top of F1 is 1/2" lower than the top of F2, which results in a tapered hull, both top and bottom. The inverted V or concave portion of the hull is a flat V at the front and V-shaped at the rear, which requires some care when cutting the foam. Using the standard hot wire technique, start at the top center and cut around the formers. When cutting the bottom, hold the wire at the V until the flat portion of the front is cut, then proceed on around the hull. Remove F2 and make the fuselage cutout. Then epoxy F1 and F2 to the foam.

After the epoxy has cured, the 1/32" plywood bottom is epoxied to the foam. Cut a triangular piece of plywood to fit the center, as well as two other pieces to cover the rest of the bottom. The piece of foam block from which the hull was cut is used to hold the plywood in place while the epoxy cures. Cover the foam support with saran wrap to prevent it sticking to the plywood.

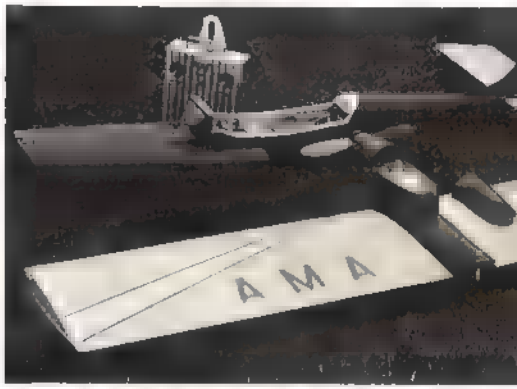
Before applying Marvelite to the top of the hull, all edges of the formers and bottom must be smooth and follow the hull's contour. The Marvelite is put on with contact cement on the foam and with epoxy where it touches the formers and bottom. Attach the nose block and carve it to shape. Apply fiberglass to the bottom of the hull, using Ambroid cement. This tough, flexible surface is easy to apply.

Fuselage and Engine Nacelle: The fuselage and engine nacelle are built as one unit, then separated for wing attachment. This assures good alignment and provides a good fit for water-proofing. Begin by cutting out the 1/16" plywood doublers, then use contact cement to glue them to the 1/8" sheet balsa fuselage sides. Make a right and a left side.

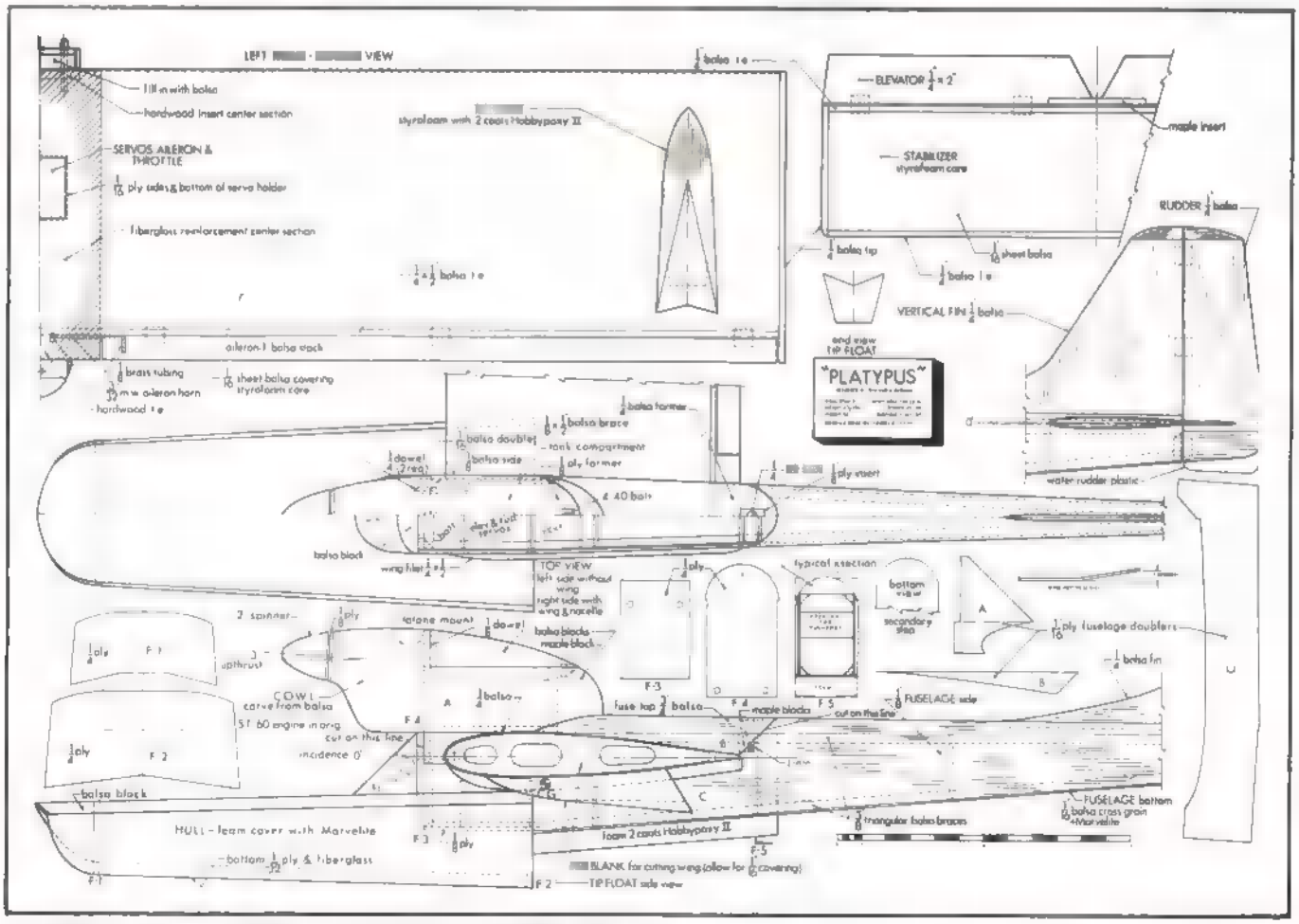
(Continued on page 83)



Uniquely shaped bow and tip floats are covered foam with MonoKote finish—simple and very effective. Quick takeoffs.



Engine mount integral with wing fairs smoothly into fuselage. Windshield helps keep RC equipment compartment dry.



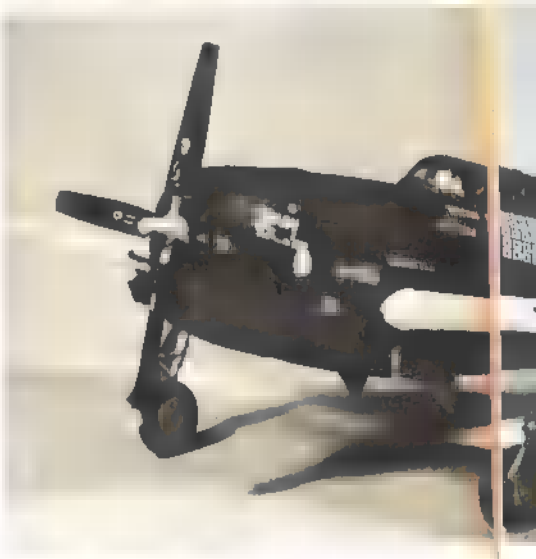
FULL SIZE PLANS AVAILABLE—SEE PAGE 70

Col. Kearby's Thunderbolt

Well-armed and armored, the P-47 was a big, heavy, prop-driven fighter. For this colorful display model, the accent is on painting, not modifications.

by J. Robert Smith

OFFICIAL U.S. AIR FORCE PHOTO



REPUBLIC AIRCRAFT'S THUNDERBOLT was the largest single-seat, single-engine propeller-driven fighter ever produced. A heavyweight, the Thunderbolt was often called the "Juggernaut" or "Jug" by the men who flew her in WW II. One of these P-47's, the Fiery Ginger, was assured of its niche in aviation history by the valorous deeds of its pilot, Col. Neel Kearby, Commanding Officer of the 348th Fighter Group, and top Thunderbolt Ace of the Pacific Theater of War, with 23 victories.

In one notable encounter, Oct. 11, 1943, Col. Kearby led ■ reconnaissance flight of four P-47D's to ■ Japanese base at Wewak, New Guinea. On the return trip, with fuel running low, Kearby attacked and destroyed a Japanese fighter. Then he found he had stumbled onto a heavily-escorted formation of 33 enemy bombers and 12 fighters in enemy territory.

Although the odds were a deadly 12 to 1, Kearby signalled for attack, plunged into the enemy's midst, promptly shot down three planes, reversed his course and knocked down two more planes on the tail of one of the wingmen. Kearby peeled off and, seeing another of the pilots threatened by ■ Japanese fighter, made ■ final pass, practically cutting the enemy aircraft in two with one burst from his eight .50-caliber guns. Six out of 45! Not a bad score for a few minutes in combat—and ■ new record for any pilot of any nation.

For this encounter, the Congressional Medal of Honor was conferred on Col. Kearby, the first WW II fighter pilot in the U.S.A.F. to receive this award. Kearby, who had scored his first victory on Sept. 4, 1943, during the operation to capture Lae, was now credited with 20 victories, just one behind Captain Dick Bong.

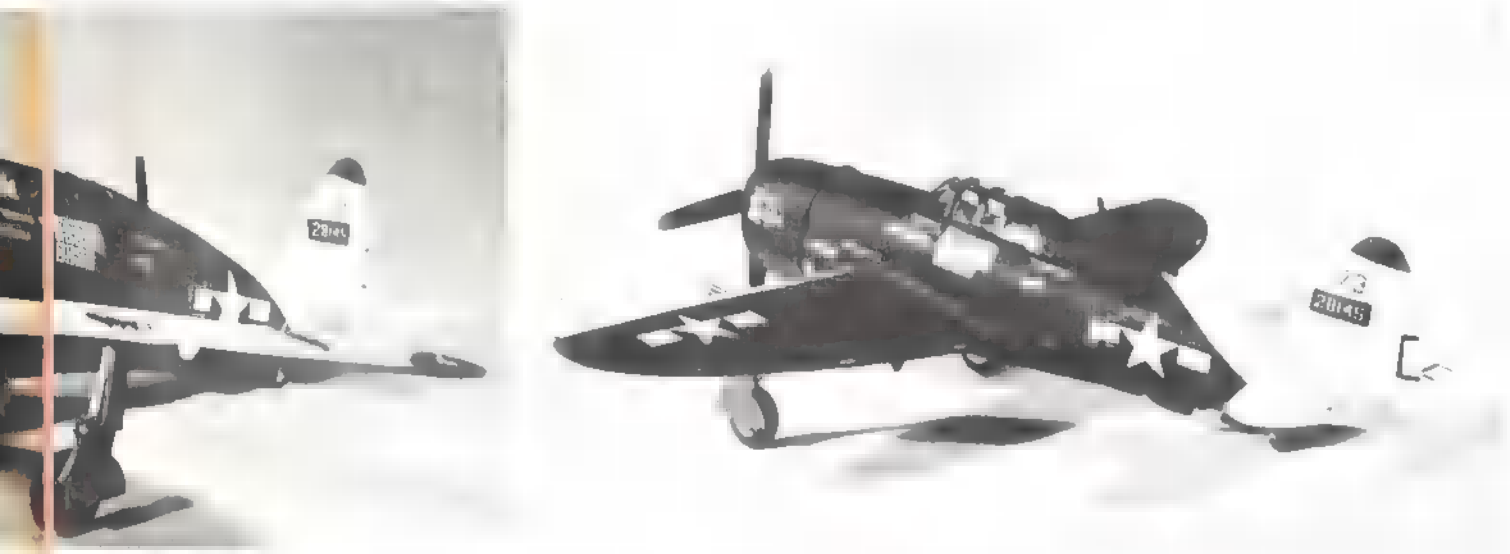
A short time later, Bong and Kearby had 23 victories apiece. Determined to "untie the tie," the Colonel and his Group HQ flight (Major Blair and Captains Dunham and Banks) headed for Wewak, scene of his earlier triumph. Just west of Dagua, Kearby sighted a formation of 15 Japanese aircraft and signalled for the attack. A quick burst from Kearby's guns, and one of the enemy aircraft spun to the earth in flames. One ahead! To add a little cushion for that hard-held lead position over Bong, the Colonel turned back into the Japanese formation. With a beautiful longe-range deflection shot from the rear, he got his second victory of the day with a single burst from his guns.

As he pulled away, three enemy fighters closed in from above and behind him. Dunham got one. Banks another. The third Japanese plane poured a burst into Kearby's cockpit. The P-47, with 23 Japanese flags emblazoned on its fuselage, plunged straight down. It never ▬ out of its headlong dive and no parachute opened. The plane just kept falling until it disappeared into the dense jungle bordering the Japanese airfield at Dagua. Thus ended the meteoric career of Col. Neel E. Kearby and his plane, the Fiery Ginger.

Construction

Materials used to build the model are one Airfix kit of the P-47D, one Frog P-47 kit, and one sheet No. 4 Authenticals Decals (found in hobby shops). Tools used include a round file or jeweler's files. If you can afford them, a complete set is most helpful. Other tools needed are a good steel craft knife; a small screwdriver or spatula (for filling in cracks); and a pin vise and assorted drills. Assorted items required are a tube or bottle of cement, ■ package of assorted rubber bands (to hold cemented parts together while drying), a roll of 1/2" masking tape, ■ sheet of Friskit paper (preferable to masking tape at times), a bottle of Magic Masker, ■ can of Duralite (for filling up seams), and a bottle of Duralite thinner.

In addition: assorted grades of wet or dry (good for sanding and for blending



dividing lines on camouflage), one sheet of the wet or dry, starting with No. 200 through No. 500; tweezers; brushes from No. 0000 to 1/4"; a can of primer coat (light gray is best because it is easily covered over), a can of Dullcote; flat enamels in assorted colors (Testor's or Pactra); curved manicure scissors; a box of round cocktail toothpicks; and household detergent.

Wash all the parts in lukewarm water and detergent, rinse in clear lukewarm water until no suds remain. Rinse small parts in a fine-mesh strainer and allow them to dry on some absorbent surface.

All parting lines or mold lines should be removed by scraping with a single-edge razor blade or sharp knife. Paint the small parts with the following colors: wheel tires—matte black with a small amount of white added; wheel centers, tail-wheel fork, landing gear struts, engine cylinders—aluminum to which a little black has been added; propeller blades—matte black with yellow tips; propeller hub fairing—natural metal; armor plate, inside wheel wells, cockpit sides and seat—zinc chromate (yellow-green); crankcase—neutral gray; shock strut cover plates—neutral gray outside and zinc chromate inside; tail wheel doors—zinc chromate inside and gray outside.

With a small flat jeweler's file, shape the canopy until it fits the fuselage. Cut canopy apart at this stage if it is to be open. Using a small brush, paint those portions of the canopy which were metal, olive drab. The pilot's face is painted flesh color; Mae West jacket, yellow; helmet, medium brown; parachute straps, olive drab; shoes and gloves, black; goggle lenses, silver; flying suit, olive drab.

Paint all the fuselage edges with liquid cement to soften the plastic. Then put the two halves together with masking tape in exact alignment. Rubber bands can be used for the same purpose. Next, cement stabilizer in place in the fuselage, using the same method with cement and masking tape on the wings.

Remove masking tape from fuselage and wings, cover all edges of fuselage with at least three coats of liquid cement where wing assembly will be joined to the fuselage. Use masking tape to draw the wing tight against the fuselage, front and rear.

Before the cement has a chance to set, use rubber bands spanwise from tip to tip to pull wing into place. After wing joint has dried overnight, put Duratite in fuselage seams, top and bottom and around the stabilizer top where it joins the fuselage. When the Duratite is dry, use No. 400 wet or dry and sand until the only Duratite left is that in the crevices. Cement landing gear and tail wheel in position. When dry, spray with several coats of good light primer: Floquil, Pactra, or Testor's. Allow at least [illegible] hours between coats for the primer to dry. Some seams may require filling in with Duratite. When dry, sand with wet or dry to make the surface smooth so that, in effect, the model looks as though it were cast in one piece.

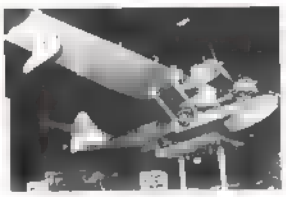
The color scheme is as follows: upper surfaces, olive drab; under surfaces, gray; tail and leading edge of wings as shown in photographs, insignia white; interior of cockpit and wheel wells, zinc chromate color; propeller blades, black with four-in. yellow tip (on prototype); hub, natural metal; block behind serial number (28145), olive drab; outline around trim tabs on rudder, elevators as in photograph, olive drab; tip of vertical stabilizer as shown in photo, blue Squadron color.

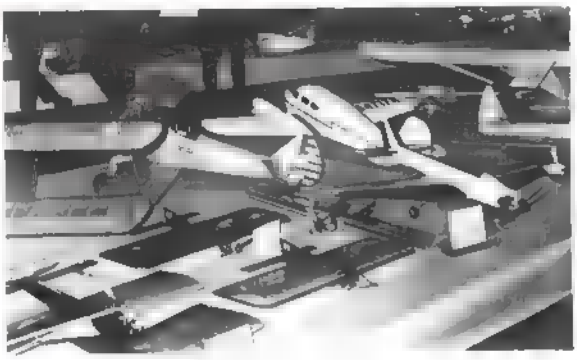
Before painting, study photos and drawings on the decal instruction sheet for color separation. The drawings also will show the location of decals.

Paint tail surfaces and leading edge of wings white, mask off areas that are to remain white and spray gray. After gray is dry, mask areas to remain gray,

(Continued on page 63)

TOLEDO





THE YEARS 1969 and 1970 must have been pretty good for our radio control model industry, considering the significant investment in new products shown at this 1971 Toledo trade show. The booths and business policies of the industry show confidence in a growing and prosperous future. Every line of equipment, planes, boats, cars, and accessories showed improvement and attention to detail.

For example, one maker showed an all-fiberglass scale Cessna Aerobat. Even the flaps, rudder, ailerons, and other small parts are molded in glass. Every line, door handle, and panel is etched into the master mold. The nose gear is vertically sprung.

In a different area, the radio systems showed investment in special ■ hybrid integrated circuitry. Those going heavily into servo amplifier integration have also taken advantage of the bridge amplifier circuits to eliminate center-tapped battery packs. One of the new IC chips has 31 semi-conductors. Some manufacturers offer fast-rate chargers so that a complete battery charge takes only a few hours, not the usual day and half the night. A good uniform battery pack is needed, but not special cells.

Other radio manufacturers have continued to refine their well-proven systems and designs. Changeable crystals are offered by some and one maker offers a switchable frequency option. Either of two adjacent channels can be chosen by a flick of ■ switch. Without question retractable landing gears are here to stay. The experts require them for polished performance, and reliability of the new units and their improved simplified installation puts retracts within the range of avid Sunday fliers. No longer is the retract unit a delicate plaything. At least four completely new retract systems were shown.

Boats showed further development in the exclusive use of fiberglass. Ready-to-use boats have existed longer than ready-to-fly planes. One now can go boating, after only two evenings' work, with a metal-flake-finished, rugged hydro. Cars also are getting the fiberglass treatment. Plastic bodies are becoming stronger through the use of more durable plastics. Dragsters are becoming popular. Flex-chassis appear to be the way to have an effective suspended GT sidewinder car.

It had been planned to have a demonstration of the proposed RC Combat rules by holding an open contest, but the wind kept the planes grounded. Gusts up to 50 mph were recorded. However, ■ reasonable quantity of combat models was displayed and, instead of having the combat flying, prizes were awarded to the static-display combat models for workmanship and design. Dremel Mfg. and J. K. Miller donated a Shop Tool and an Air Brush Spray outfit respectively for these awards.

The Toledo show always is operated by the Weak Signals Club. They had quite a time selecting winners in their many categories and had a full table of beautiful prizes.

The models on display were, ■ usual, awe inspiring. Winner of the Art Christen Award for the best model displayed by a Junior went to 15-year-old Ray Hosttler for his Dyna-Jet-powered McDonald Phantom F-4 (built from AAM plans). Both Military and Non-military Scale awards were won by Walt Mocha for his JN-4 Jenny and his Fly Baby. In Boats, awards went to Don Boke and Harold Van Horn. Best Pattern design was won by Jerry Worth; Pylon was topped by Dave Gierke. Best Car design was won by Stuart Stanfield.

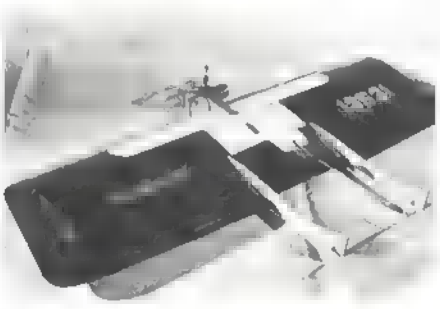
Perhaps the best news of all is that next year the show area will be double the present size, but at the same place and time. Attendance was well over 8500 this year. Next year the crowded Swap Shop and display areas will be big enough for all comers.

Ed Sweeney

WORLD'S BIGGEST RC SHOW

Royal Products Corp./F4J RC. 61-powered model of U.S. Navy Phantom, designed for full-house RC operation. 480 sq. in. wing area. $49.95. Royal Products Corp., 6190 E. Evans Ave., Denver, Colo. 80222

Carl Goldberg Models/Super Ranger. Rugged, fully assembled vacuum-formed fuselage uses doublers and braces for beginner's rough landings. Kit comes complete with ailerons, links, horns, other hardware. Easy to fly. [redacted]" span, weight 4 to 4 1/2 lb., 19 to 40 power. $39.95. Carl Goldberg Models, 2541 W. Cermak Rd., Chicago, Ill. 60608



Du-Bro/Sea Bird. Unusual RC amphibian can be equipped with fully retractable hull-mounted main gear. ABS plastic, plywood and balsa construction. Fully aerobatic; power from 40 to 61, with 45 recommended for all-around good performance. $59.95. Du-Bro Products, Inc., Wauconda, Ill. 60084

Penford Plastics Corp./Scale Fiberglass P-51. Tops in realism, O-Model of famous WW II fighter uses four-bladed prop, other full-scale details. Fiberglass fuselage and fin, pre-cut wing and stab ribs, steel wing jig dowels for accurate fabrication. 62" span, 61 power recommended. $74.95. Penford Plastics Corporation, 320 Curtis St., Delaware, Ohio 43015

C.M.I. Quality Airplane Kits/RC Guillotine. Grade A, hand-selected balsa with quality throughout, [redacted] combat fighter is designed for 15 to 23 engines. Fast construction, very maneuverable but stable. 42" span. $10.95. C.M.I., 945 65th St., Des Moines, Iowa 50312

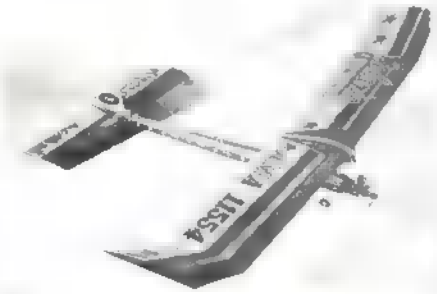
Vic's Custom Models/RC Ercoupe. Fiberglass-fuselage model of the famous post-WW II private plane, kit features pre-formed gear, balsa fins, rudders, stabs. Span 62", 5 to 5 1/2 lb., 35 to 60 power. $69.95. Also available, clear canopy with deluxe, detailed interior, $6.95 extra. Vic's Custom Models, 618 Cowpath Rd., Montgomeryville, Pa. 18936

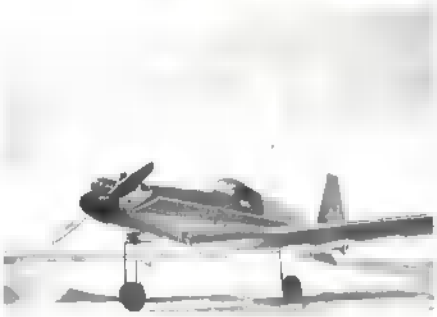
[redacted] Radio Control Products, Inc./Cessna 150. The Aerobat, with fully operational flaps, is 1/6-scale in every detail. Fuselage and flying surfaces of fiberglass, 65" span, 5 lb., 45 to 60 power. $89.95. Scale Radio Control Products, Inc., 101 E. Main St., St. Charles, Ill. 60174

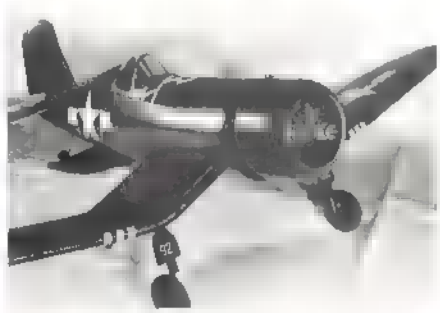
Sterling Models Inc./Rimfire. High-performance RC [redacted] engines up to 45, plane flys at approximately 3 1/2 lb. Die-cut fuselage sides, steerable nose gear, accessories such as nylon fittings, rods, aluminum engine mount, canopy, decals, etc. Span 54". $27.95. Sterling Models Inc., Belfield Ave. at Wister St., Philadelphia, Pa. 19144

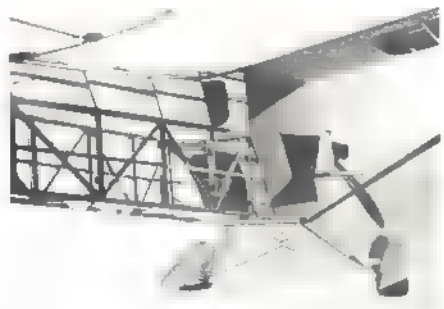
World Engines/Pilot Sailplane. 7' sailplane uses 10 power, foam wing with ABS plastic covering, computer-designed airfoil for maximum lift. Under $50. World Engines, 8960 Rossash Ave., Cincinnati, Ohio 45236

Dumas/Corsair. A profile CL stunt version of U.S. new A-7 Corsair II attack fighter. Great for slow combat. 35 power, 38" span. $11.95. Dumas Products, Inc., 790 S. Park Ave., Tucson, Ariz. 85716









The Model Maker/Galaxie. Free-flight for 1/2A or A/B power, kit features top quality pre-cut and shaped balsa, geodetic wing construction. Plane holds 10 free flight National records. 1/2A, $5.95; A/B, $12.95. The Model Maker, 1636 E. Edinger, Unit N, Santa Ana, Calif. 92705

Joy Products Co., Inc./JN-4D. True scale realism from original Curtiss drawing. Kit and accessory package contain everything, scale turnbuckles, parts for wire wheels, plastic OX-5 engine cylinders, rigging. For RC display. For 29 to 49 engines. Price with accessory pack, about $45. Joy Products Co., Inc. Menominee, Mich. 49858

AAMCO/MiniMaster. RC sportster uses only 15 to 23 power, full-house operation with small RC system. Steerable nose wheel, clear canopy, flying weight under 3 1/2 lb. 49 1/2" span, extra rugged construction. Andrews Aircraft Model Co., Inc., 2A Putnam Ct., Danvers, Mass. 01923

J and J Industries/American Eagle. Giant sailplane with all-wood construction, built-up wing. 764 sq. in., 102" span, weight, 3 lb. J and J Industries, Box 202, Oakhurst, N. J. 07755

Hot Line Models/Mooney Chaparral. 70 1/2" span, recommended for power, kit uses built-up construction from machine-cut, sanded parts select balsa. Formed gear, control horns, bellcranks. Weight, 7 to lb. Can be adapted to retract gear. $55. Hot Line Models, Inc., 3610 Thurman, Amarillo, Tex. 79109

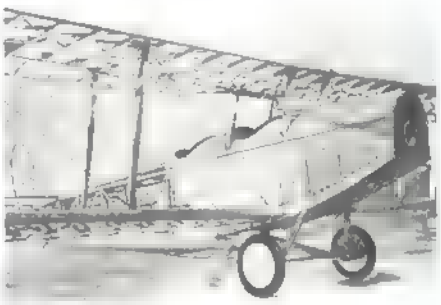
Lanier/Colt. New, stylish full-house RC gives superb performance on 60 power, flies well on 45 too. Span, 55"; weight, equipped, under 6 lb. Foam wings, tail use hard-covering technique. $54.95. Lanier Industries, Inc., Briarwood Rd., Oakwood, Ga. 30566

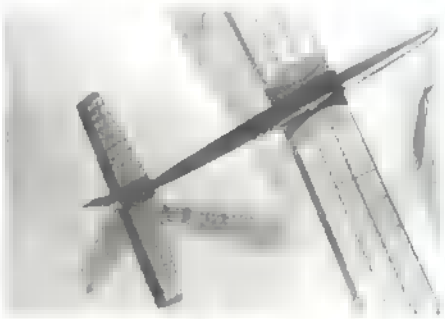
Wing Mfg./F4U-1 Corsair. Impressive-looking WW II fighter Navy colors uses 60 power and gives excellent flight characteristics. 63" span, fiberglass fuselage, molded cowl sections and canopy, foam wing cores. $69. Wing Manufacturing, Box 33, Crystal Lake, Ill. 60014

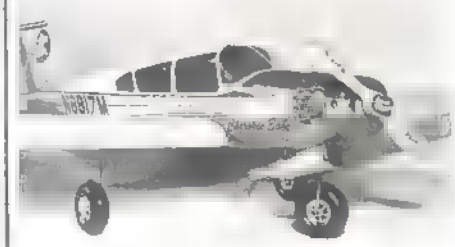
Indy R/C Specialties/Coyote. ARF with fiberglass fuselage, MYCO-covered wing and stab, pre-installed firewall and motor mount. 61 1/2" span, 630 sq. in. wing area, engine 45 to 61. $69.95. Also available in standard kit minus accessory hardware, $59.95. Indy R/C Specialties, 10538 Jessup Blvd., Indianapolis, Ind. 46280

Span Aero Products/Piper J3. So big it won't fit in the picture! 8' wing, kit uses aluminum wing spars and tips, tail surfaces, fiberglass cowl and parts. Easy access to RC compartment through fuselage door. Flying weight under 9 lb. 60 power recommended. $79.95. Span Aero Products, Box 63, Norwalk, Conn. 06856

VK Model Aircraft Co./Cherokee. Big, powerful, high performance Cherokee flies on 40 to 61 power, weighs 6 1/2 lb., 65" span, 18% symmetrical airfoil. Steerable nose wheel. $39.95. Pictured is the $27.50 Cherokee Babe which spans 53" and uses 23 to 40 engine. VK Model Aircraft Co., 12072 Main Rd., Akron, N.Y. 14001







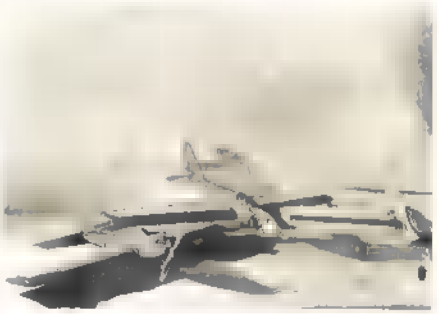
Rand Sales Co./Sky Kangaroo. For small field, low-power flying with lightweight airborne equipment, powered glider requires only 09 power. Precision cut wooden parts, built-up construction. 57" span. $14.85. Rand Sales Co., Box 20059, Columbus, Ohio 43220

Markel Model Co./Aero J. Fully aerobatic, Aero J is semi-scale in appearance, flies on 40 to 60 power, 52" span. One-piece fuselage sides, spruce spars, quality prefabricated parts. Weight 5 lb. Markel Model Company, c/o Bus. Sec. Assoc. Inc., Box 27148, Columbus, Ohio 43227

Dee Bee/Super Eyeball. ARF version of Eyeball features some sport and competition characteristics of earlier version but uses molded fuselage shell, bolt-on wings, no painting or finishing, 15% symmetrical airfoil, 6-lb. flying weight, 45 to 60 power. One evening's building time. $59.95. Dee Bee Models, W. Lambs Rd., Pitman, N.J. 08071

Aero Precision/Touchdown. For 3- or 4-channel operation on 15 to 19 engines, plane is available with two wings: 48" trainer 42" performance. Weight, 3 lb. $19.95. Extra foam core option wing, $8.95. Aero Precision, Collins Industries, Inc., 322 N. East St., Tipton, Ind. 46072

Kyosho/P-51. 1/9 scale for small proportional RC, recommended for 29 to 50 power, 48" span, 41" length, all parts computer-machine cut and hand finished. Metal cowl, plastic canopy, all necessary hardware, real silk covering. The Model Maker, Kyosho, 1636 E. Edinger, Unit N, Santa Ana, Calif. 92705

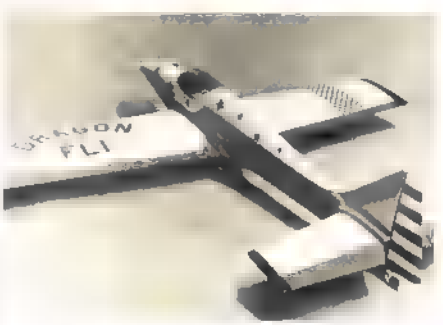


World Engines/Pilot CL ARF's. New series of four formed plastic ready-to-fly control line trainers and stunters. Range is 09 to 35 engines and $14 to about $20. Takes only ½ hour work to prepare for flying. Available mid-summer. World Engines Inc., 8960 Rossash Ave., Cincinnati, Ohio 45236

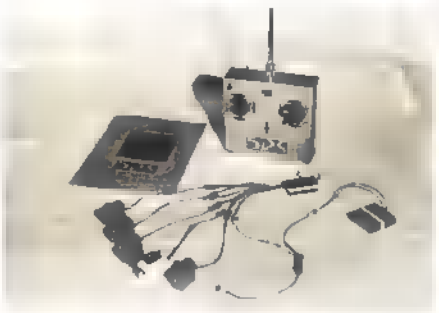
WAVE/Honeycomb Wing. Ultimate in strength and finish, wing uses honeycomb core, epoxy, and fiberglass for tough exterior. Available in colors for Ugly Stick, Sunfli IV, and Kaos. $49.95. Others to be developed. WAVE, 1237 S. Wells Rd., Saticoy, Calif. 93003

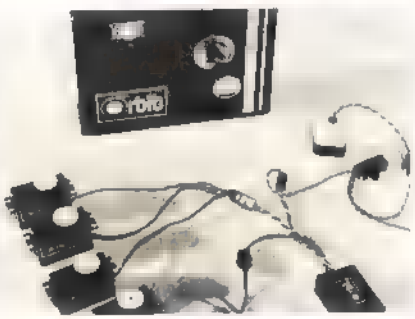
The Mini-Flite Co./Super-Cub. All-plastic 90%-scale kit for single channel through multi. Semi-symmetrical wing. 19 recommended. Floats available at extra cost for ROW operation. The Mini-Flite Co., 48 Princeton St., Red Bank, N.J. 07701

R/C Kits/F7F Tigercat. Scale version of Navy twin WW II fighter for 45 or 60. Built-up wing of egg-crate construction. All parts beautifully cut out. Fiberglass cowls. $59.95. R/C Kits, 353 Briar, North Canton, Ohio 44720



Reddi-Flite/Dragon Fli. A most complete ARF fiberglass and foam/plastic version of Phil Kraft's competition model. Suitable for retract gears. Choice of orange, red or blue fuselage. 62" span for 60 engines. $79.95. Reddi-Flite Products, Box 608, Lansdale, Penna. 19446





Larson Electronics/5RS Series 2000. Highest output power for any 72 MHz transmitter. Ultra-lightweight, potted receiver weighs only 1.7 oz., small size makes Series 2000 compatible with almost any plane. Excellent noise rejection features. $349.95. Larson Electronics, 2289½ So. Grand Ave., Santa Ana, Calif. 92705

World Engines Inc./Pro-Digit. A beginner's system with ■ channels available, but sold with the new two-servo-and-receiver brick only. New World Engine-designed integrated decoder, FET receiver, and integrated bridge servo amplifier. $150. World Engines Inc., 8960 Rossash Ave., Cincinnati, Ohio 45236

Orbit/Single-stick RC. 4-channel RC system with rechargeable nicads. Transmitter output, 1/2 watt on one of 15 available frequencies. System includes PS-30 or PS-40 servos in any desired combination. 4-channel system (shown), $439.90; 6-channel, $489.90. Orbit Electronics, Inc., 18065 Euclid St., Fountain Valley, Calif. 92708

Heathkit/Servo simulator. Unit permits adjustment of proportional pulse-driven servos and also serves as battery charger. No need to energize transmitter for routine adjustments. Battery charge rate, 45 mA. Also operates on optional battery pack for field use. One evening's construction time. For additional information, write Heathkit, Benton Harbor, Mich. 49022, for data on Model GD-206.

Min-X Radio, Inc./Astromite 72 Single-stick. Available in ■ to 6 channel, 4-channel shown. With rechargeable nicad batteries and isolation transformer. 800 mw transmitter output with center-loaded antenna. Integrated circuitry. 100% pre-tested for reliability. $349. Min-X Radio, Inc., 8714 Grand River, Detroit, Mich. 48204

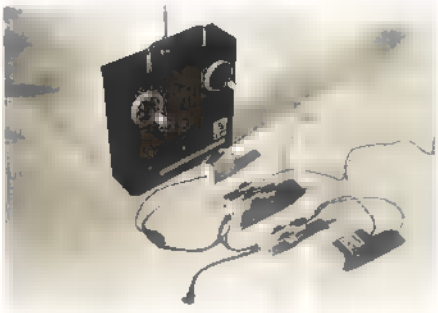
Rand ■■■ Co./Digiace. Four-channel digital proportional system provides high reliability and excellent performance ■ surprisingly low price. Dry cell power. Airborne weight, 13 oz. $169. With nicad batteries and charger, $219. Rand Sales Co., Box 20059, Columbus, Ohio 43220

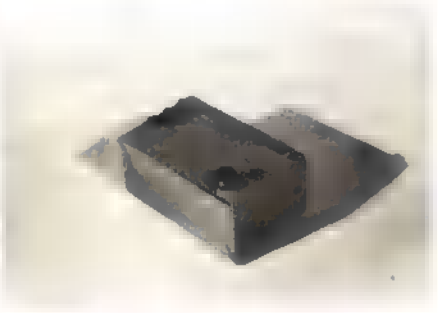
EK Logictrol/LRB Series RC system. For basic, reliable 2-channel operation of small boats, race cars, gliders, etc. LRB (Li'l ■■■ Brick) uses integrated receiver ■■■ 2-servo output. Dry-cell operated. Two-control unit, $99.95; three-control, $159.95; four-control, $249.95. Nicad battery pack available ■ extra cost. EK Products Inc., 3233 W. Euless Blvd., Box 1015, Hurst, Texas 76053

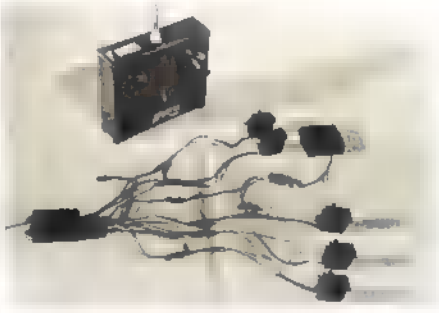
EK Logictrol/Six-channel RC unit. Deluxe system features variable frame rate for precise control over more than 200 distinct servo positions. Tension-adjust screws on control stick allow adjustment to specific preference. Output 600 mw on 27, 53, or 72 MHz. Nicad-powered. Five-control unit, $369.95; 6-control (shown) $399.95. EK Products Inc., 3233 W. Euless Blvd., Box 1015, Hurst, Texas 76053

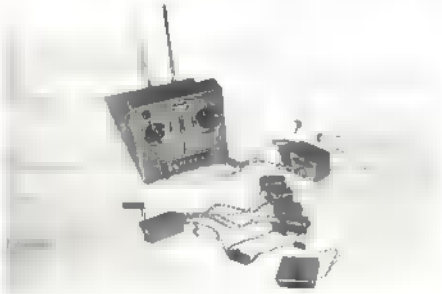
Hobby People/Four-channel RC. Available with two servos as ■ starter, Phoenix can be expanded to full 4-channel operation later. Quality at a low price. With two RS-4 mini-servos, flight-gear nicads and recharger, switch and servo tray, $139.99. Hobby People, 130 E. 33rd St., Los Angeles, Calif. 90011

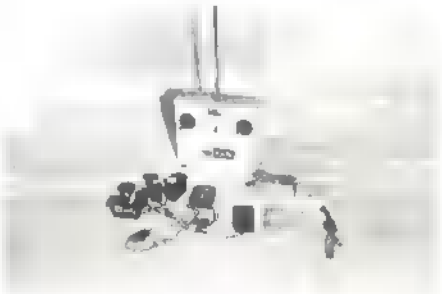
MRC/Three-channel RC unit. New F713 provides digital proportional control at reasonable price. Interchangeable crystals for 5 frequencies. Vinyl-covered transmitter, 27 or 72 MHz. With two servos on 27 MHz, $150; on 72 MHz, $160; extra servo, $30; nicads and charger, $40 extra. Model Rectifier Corporation, 2500 Woodbridge Ave., Edison, N.J. 08817











Citizenship/Six-channel RC. DV-6 digital proportional system uses DPR-6 receiver, four DMS servos, nicad battery pack for airborne unit. Receiver [illegible] integrated circuitry. 27 MHz, $399.95; 72 MHz [illegible] 6 meters, $419.95. Citizenship Supreme R/C Systems, Box 297, Westfield, Ind. 46074

ProLine/Competition Six-channel RC. Open-gimbal, single-stick system employs deluxe features throughout. Extreme sensitivity and durability are characteristics. Built-in training system, gear-retracts servo, gold-plated contacts, MIL-SPEC-Style harness are utilized. 1.1 watt output on 27 MHz and [illegible] meters, .6 watt on 72 MHz. $499.9. ProLine Electronics, Inc., Box 7733, Phoenix, Ariz. 85011

Kraft System/Six-channel. Top-of-the-line Kraft has five proportional functions, landing gear up/down switch, two-frequency switch, transformer charger, and student/trainer chord with button standard. $479.95 with 4 servos. Any set of two adjacent frequencies may be selected. Also choice of any combination of Kraft servos. Kraft Systems, Inc., 450 W. California Ave., Vista, Calif. 92083

Cannon Electronics/Super-Flite 4. Slant-Tenna case, Kraft sticks, [illegible] choice of seven servo types. [illegible] built-up systems. On 27 MHz, the kit is $214.95, built-up, $289.95. Add $10 for 53 or 72 MHz. Buddy-Box circuit included and variable logic frame rate. Cannon Electronics, 13400-26 Saticoy St., North Hollywood, Calif. 91605

Royal Electronics/Apollo 4. New, inexpensive import line available [illegible] 27 MHz only in 4- [illegible] 5-channel versions. Rotary output servos, American-made nicad batteries and high-transmitter output power [illegible] features. Flying weight is 14 oz. $289.95. Royal Electronics Corp., 2119 S. Hudson St.,, Box 22204, Denver, Colo. 80222

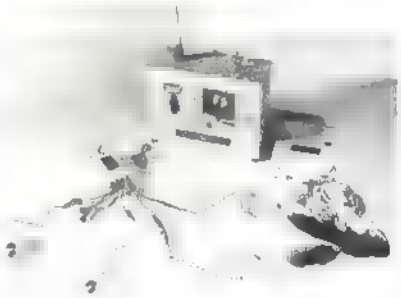
Dumas/SK-Daddle. Now in fiberglass, ready to go when you add 19 engine, shaft and two-channel RC rig. Available in blue, red, gold, or green metal-flake with white bottom. $49.95. Dumas Boats, [illegible] 6093, Tucson, Ariz. 85716

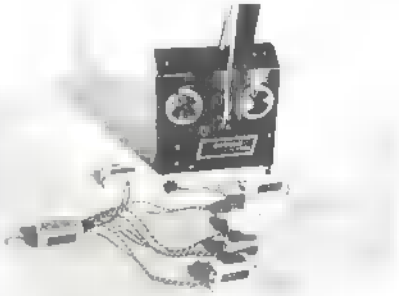
The Mini-Flite Co./Mini-Vee. Plastic version of off-shore racing boat for single to multi controls and up to 19 engine. Features three sealed foam flotation compartments and sealed RC compartment. Die-cut plywood parts for strength. $22.95. The Mini-Flite Co., 48 Princeton St., Red Bank, N.J. 07701

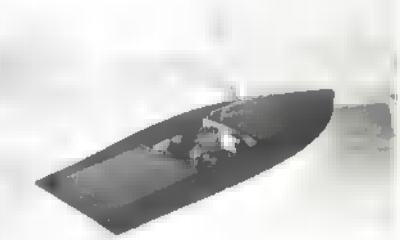
3-D Models/Fiberglass hydroplane. Buck-or-Two, record-setting hydroplane, features glassed-in-place aluminum stress plates for mounting strut, rudder, skid fin mounting. Spruce stringers, foam flotation. Available in white, yellow, black, solid, or two-tone colors. Accessory hardware also available, extra cost. Base price, $89.95. Daniels Design and Development, 4131 Colonial Dr., Royal Oak, Mich. 48072

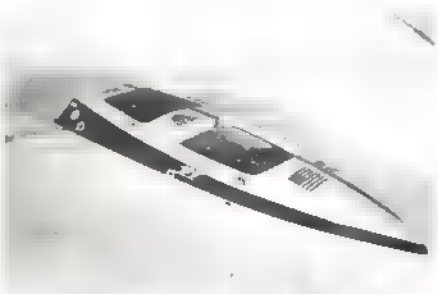
PMP/Stiletto. 30" sport racing boat for full-house competition, kit is finished in one of ten eye-catching metal-flake colors. 19 to 45 power. PMP Mfg., 2893 S. Shoshone, Denver, Colo.

G.E.M. Models/Lightning Bolt 21. Kit includes hull and deck sections of white molded fiberglass, operates [illegible] 09 to 23 power. Length 21 3/4", beam 10". Large enough to accommodate most radio systems, although smaller units are recommended. High performance design. $25. G.E.M. Models, Box 342, Broadview, Ill. 60153



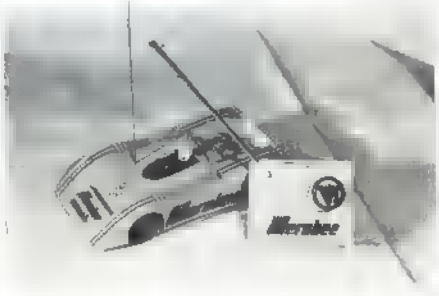




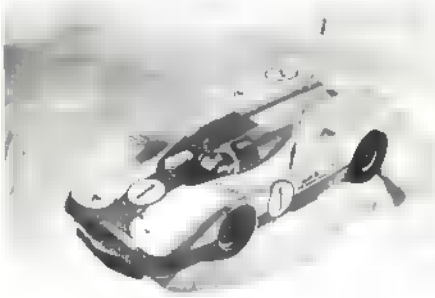


Octura Models/4-point hydroplane. White Heat 15 is designed for engines of 60 and up. 40" length, 20" beam, fitted with Octura steering strut. Price and kitting plans to be announced. Octura Models, 8148 N. Milwaukee Ave., Niles, Ill. 60648

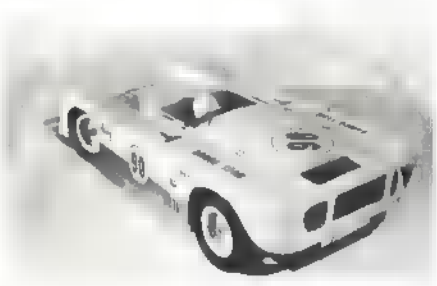
Jerobee Industries Inc./Commando. Completely assembled, ideal for beginner, 1/12-scale racer uses fully-proportional RC system, .049 engine, steering and throttle control. High strength Cycolac body. No FCC license required. $109.95. Jerobee Industries Inc., York Center, Redmond, Wash. 98052



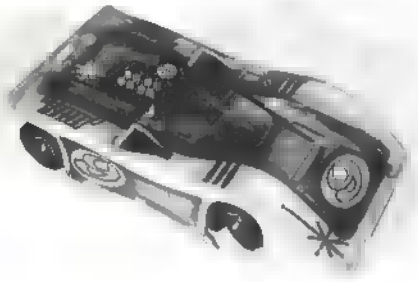
The Model Maker/Porsche RC racer. In three body styles, Lola T-70, McLaren, and Porsche 917 (shown), 1/8-scale kits feature adjustable centrifugal clutch and brake systems, super-soft sponge rear tires, cast mag hubs, decals, servo mounting brackets, other hardware. Three spur-and-pinion gear sets (6:1, 5:1, and 4:1) included. Less engine and RC gear, $75. The Model Maker, Kyosho Co., 1636 E. Edinger, Unit N, Santa Ana, Calif. 92705



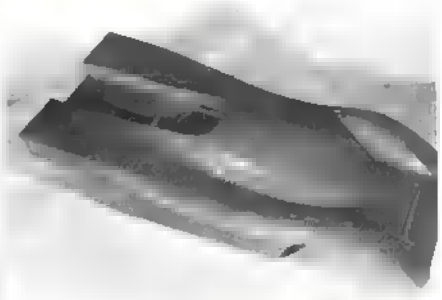
AAMCO/Trac-Master RC racer. 1/8-scale kit will accept Porsche, Ferrari, Chapparal body. Chassis has adjustable wheelbase, camber, caster, toe-in, and tracking. Easy construction in about two hours. With selected spare parts, less engine and RC gear, $69.50. AAMCO Technical Model Associates, Inc., 2A Putnam Ct., Danvers, Mass. 01923



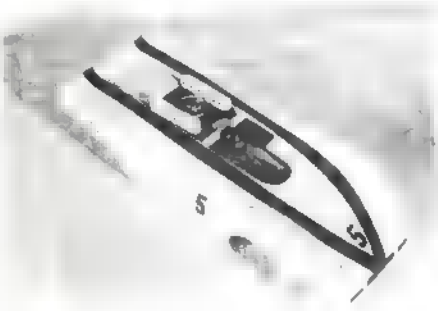
Delta Systems/RC Car. 1/8-scale Delta Dash III features ball-bearing power train, automatic clutch, foam tires and independent front suspension. Quick-change gear ratio and adjustable wheelbase provides flexibility for various racing conditions and bodies. With 5:1 box. $69.95. Body and 19 engine not included. Delta Systems, Box 754, Bridgetown, Mo. 63044



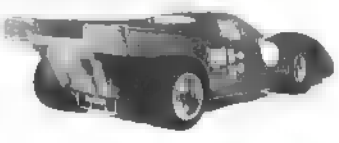
Scale Radio Control/1/8-scale fiberglass bodies. Available fiberglass in popular 1/8 scale are McLaren MK8D, Porsche 917 (shown), and Ruby. Authentic in all details. Scale Radio Control Products, Inc., 101 E. Main St., St. Charles, Ill. 60174



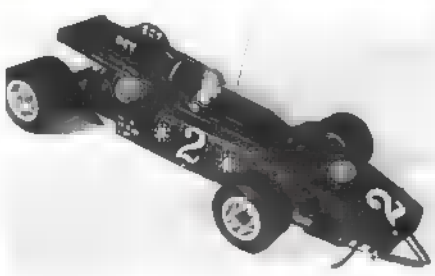
RCE/1/8-scale vacuum-formed bodies. Many authentic bodies of top concourse Championship winners. Porsche 917 roadster body shown, $8. Also available, Dave Bloom's custom-painted bodies, $18 to $22 including body. .060 butyrate plastic construction. Race Car Enterprises, 3703 Dover Dr., Fort Wayne, Ind. 46805



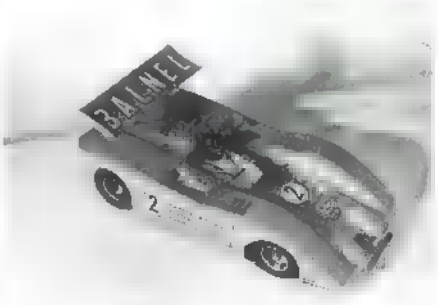
MCE/RC chassis for racers. System of upgrading allows builder to move up from basic $60 flat-pan chassis to more sophisticated U-frame models. Modular parts interchange between four chassis styles. 6:1 gearing. Write for brochure. Model Car Enterprises, Inc., 944 3rd Ave., Brooklyn, N.Y. 11232

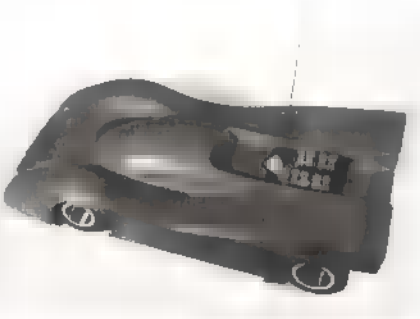


PMP Mfg./STP Indy car. Metal-flake color molded into fiberglass body. Decals also available for extra zing. $19.95. PMP Manufacturing, Box 10233, Denver, Colo. 80210



Curtis-Balnei/McLaren RC car. Using Balnei-designed modifications to the basic off-the-shelf Curtis-car, design offers real top-flight track performance. Two bodies available, Formula and McLaren (shown) Numerous Balnei accessories also available. $59.50. Curtis-Cars, Box 297, Westfield, Ind. 46074





Dynamic Models/Porsche 917. 1/8-scale complete with Orbit 2-channel Handi-Grip transmitter, receiver, two PS-5 servos, and Veco 19RC engine. Ready to go. $289.95. Dynamic Models, 13309 Saticoy St., North Hollywood, Calif. 91605

ProLine/Retract gear. Completely nylon bushed unit with steel and aluminum parts, offers long-lasting rugged performance. Counter spring on all legs allows low-effort movement. Nose gear, $29.95. One ProLine servo ($42.50) will move all three units. ProLine Electronics, Box 7733, Phoenix, Ariz. 85011

Royal Products/Retractable gear. New RMK Special units have sturdy aluminum housing with [illegible] and plastic inner workings. Durable bearing surfaces and no noise [illegible] Nose gear, $19.95. Auxiliary power units also available at $18.95. Royal Products Corp., 6190 E. Evans Ave., Denver, Colo. 80222

Wing Mfg./Retract gear. Considerably updated, faster and more powerful versions of a well-proved unit. Much stronger and larger diameter jack screw featured. Tight-fitting dust cover. Several versions, [illegible] for scale others for pattern. $18.95. Wing Mfg., Box 33, Crystal Lake, Ill. 60014

Carl Goldberg Models/Retract gear. Tricycle gear system weighs only 5 oz., dual wheel only 3 oz. Simple, straightforward construction keeps height to only 1" and requires very little actuating force. Pair of main gears, $9.95. Tricycle (shown), $19.95. Carl Goldberg Models Inc., 2541 W. Cermak, Chicago, Ill.

Kraft Systems, Inc./Multicon retract gear. Fully sealed unit is electrically driven by self-contained, low-drain motor. Nose gear mounts vertically or horizontally. Transit time, approximately [illegible] sec. on 2.4V source. Positive lock [illegible] and down position. Tricycle system, $59.95; main gears, $19.95 each. Kraft Systems, Inc., 450 W. California Ave., Vista, Calif. 92083

Selectronics/CAS retract gear. 3 oz. [illegible] each main gear, 3 1/2 oz. for nose gear. Requires [illegible] oz. of pull, 11/16" actuating throw. Height, 1 1/4". With mounting plates. Two main gears, $29.50; nose gear, $19.50. Selectronics Co., 463 Blossom Hill Rd., San Jose, Calif. 95123

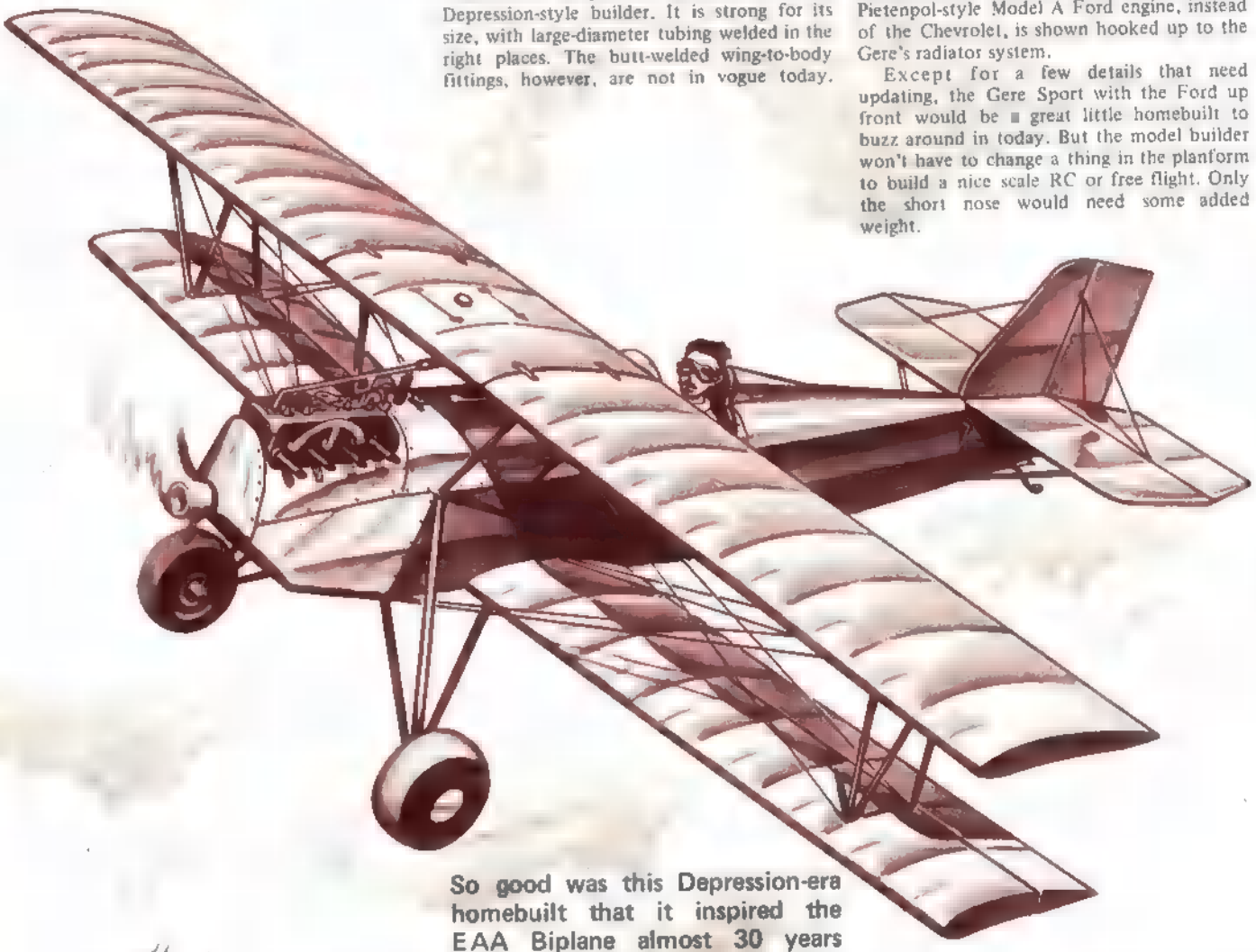
Technisales/Standard [illegible] Mini retracts. New price on these popular units is under $50 for complete set, either standard size or mini. Nose gear weighs only 4 oz. Technisales, Box 822, San Gabriel, Calif. 91775

Ross Engines/Large-scale power. Ross provides [illegible] wide array of twin 60 and larger power units. Two-cylinder opposed and in-line alternate firing twins, 4-cylinder opposed, 5-cylinder radials [illegible] among various engines which are available or pending. Some with blower, oil extractors on others, remove 90% of the castor oil in exhaust. Many other experimental features under development. Write for price and availability of complete line to Concord and West Manufacturing Co., 255-03 West End Dr., Great Neck, N.Y. 11020

The Gere Sport

So good was this Depression-era homebuilt that it inspired the EAA Biplane almost 30 years later. An ideal modeling subject.

by ROBERT PARKS



ONE OF THE NICEST-LOOKING homebuilt biplanes, the Gere Sport never reached the level of popularity which the Heath Parasol and Pietenpol Aircamper enjoyed. Nevertheless, it was well-designed for cheap, simple construction and for good flying characteristics.

The original Gere was a Depression baby, born in the days of muslin covering and wornout auto engines. Its engineering was good in all respects except one: the powerplant, a four-cylinder overhead valve Chevrolet engine of 1927 vintage. As a result, the Gere wasn't a world-beater, but it did fly fairly well. What the engine lacked in power was made up for by a good airplane. So good was the basic design that, thirty years later, it was modernized and appeared as the EAA Biplane.

Designer of the original plane was a 19-year-old youth named Bud Gere, who never saw his plane fly. He was killed while experimenting with a powered iceboat. If this little biplane is any example of his engineering talents, his contributions to aviation would have been great.

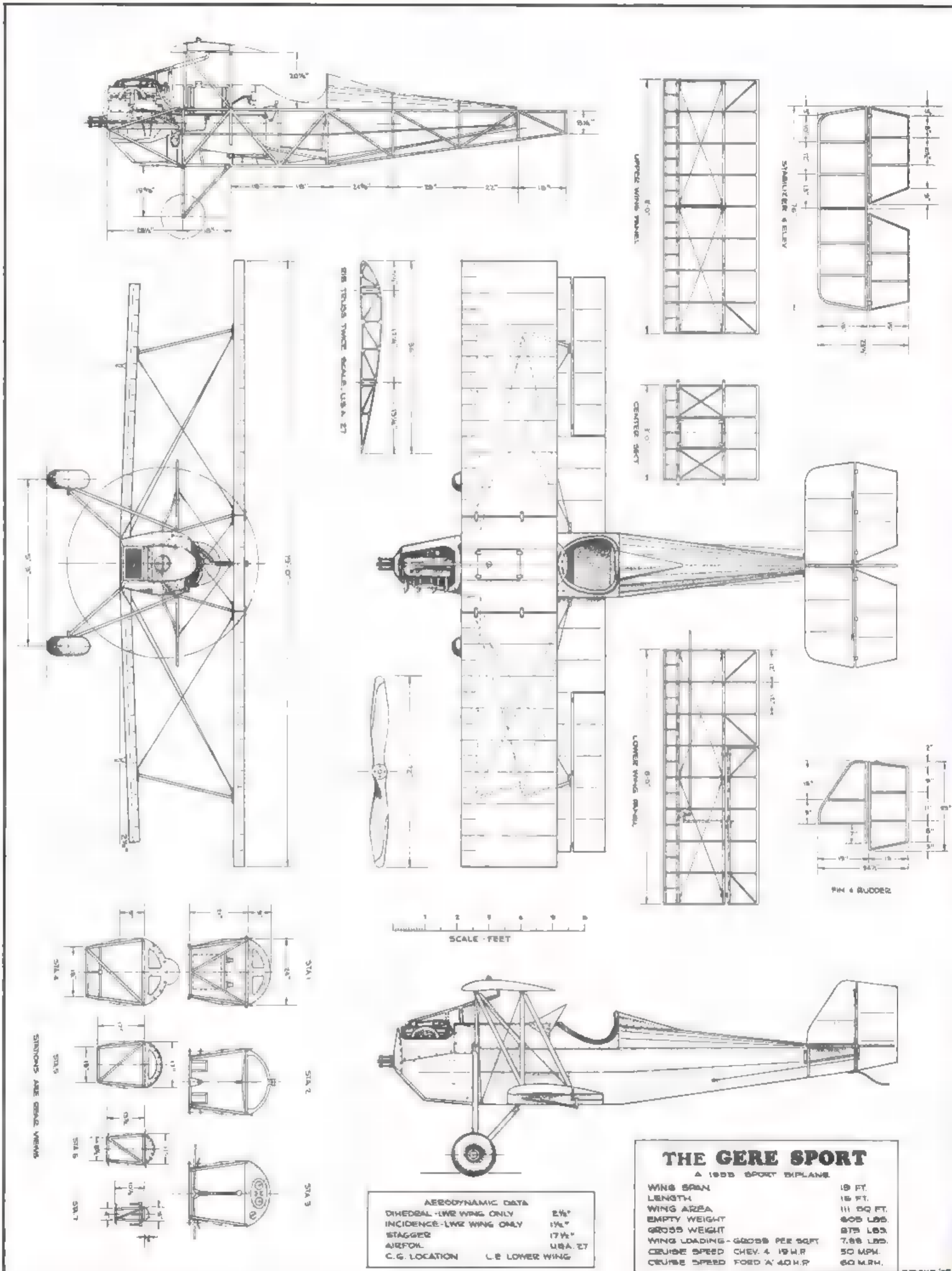
The Sport has all the things that a good biplane should have: a fairly high aspect ratio, good gap-chord ratio, ample tail surfaces and ailerons, and a clean, straightforward structure. Of interest is the use of low pressure tires instead of the hard variety commonly used by the early homebuilders. Bud Gere took advantage of the Goodyear Corporation's development of soft, fat tires, which eliminated the need for shock-absorbing devices in the gear, a la Flybaby.

The entire airplane is a collection of straight tubes and sticks, which made construction simple and inexpensive for the Depression-style builder. It is strong for its size, with large-diameter tubing welded in the right places. The butt-welded wing-to-body fittings, however, are not in vogue today. Welds loaded in tension can give up at the most embarrassing and disastrous times, especially when the ship is airborne.

The wings look as though they came from a beginner's stick model. All ribs are equally spaced at 12 inches and the tips just "happen" at the last rib, which is covered with plywood. The USA 27 airfoil was quite popular at the time the ship was designed and is as well-suited for the Gere as it was for many other aircraft of the period. On the structural side, the unrouted spruce spars were extremely heavy for a little bird like this and easily could have been replaced by 3/4-inch stock.

The drawings depict the design exactly as Bud Gere executed it in 1933, except for the inclusion of Ford Model A power. He recognized the overweight, underpowered condition of the Chevy 4 and recommended that Pietenpol's Model A installation be substituted to increase performance. So, a Pietenpol-style Model A Ford engine, instead of the Chevrolet, is shown hooked up to the Gere's radiator system.

Except for a few details that need updating, the Gere Sport with the Ford up front would be a great little homebuilt to buzz around in today. But the model builder won't have to change a thing in the planform to build a nice scale RC or free flight. Only the short nose would need some added weight.


THE GERE SPORT
A 1933 SPORT BIPLANE
WING SPAN 19 FT.
LENGTH 15 FT.
WING AREA 111 SQ FT.
EMPTY WEIGHT 605 LBS.
GROSS WEIGHT 875 LBS.
WING LOADING - GROSS PER SQ.FT 7.88 LBS.
CRUISE SPEED CHEV. 4 19 H.P 50 MPH.
CRUISE SPEED FORD 'A' 40 H.P 60 M.P.H.
AERODYNAMIC DATA
DIHEDRAL - LWR WING ONLY 2½°
INCIDENCE - LWR WING ONLY 1½°
STAGGER 17½"
AIRFOIL U.S.A. 27
C.G. LOCATION L.E. LOWER WING
SCALE - FEET
UPPER WING PANEL
CENTER SECT
LOWER WING PANEL
STABILIZER & ELEV
FIN & RUDDER
RIB TRUSS TWICE SCALE, U.S.A. 27
STATIONS ARE REAR VIEWS
STA 1
STA 2
STA 3
STA 4
STA 5
STA 6
STA 7

Troop Glider and Tug

A most unusual scale CL project, the once-common Curtiss C-46 Commando twin-19-powered profile model for towing a true-scale replica of the infamous CG-15 glider.

by FRANK SCOTT

Each model is a complete control liner in itself. Glider might whip control also.

Quick-fill tank useful to assure equal and complete engine runs. Top off before flight.

SOME CALLED THEM "Whisper Ships" and others knew them as "America's Answer to the Kamikaze." The troop-carrying glider provided a unique chapter in military aviation.

Widely used by both sides in WW II, the troop glider filled a void in transport design. Through their hinged noses they could easily load large, bulky items such as jeeps and small bulldozers, which conventional cargo airplanes, regardless of size or power, simply could not carry. The glider also could be landed in small, unprepared areas and, because of its much lower cost, could be expendable.

Built by the thousands by furniture and piano factories, as well as by more traditional aircraft sources, these almost helpless craft served well throughout the war. Their exploits in Normandy and Burma are still remembered. However, the gliders now have been totally replaced by assault transports, improved parachuting techniques, and helicopters. The troop glider is gone and few will mourn its passing.

To fly a replica of these gliders on control lines, no unusual skills are involved, and the price of an engine is saved. Instead of pulling a free flight glider behind a control line ship (as has been attempted before, with disastrous results), this glider is built as a normal control line model which is simply towed by another plane. This duplicates full-size practice in that each plane has its own controls and its own pilot.

The CG-15 can be pulled by either a 35-powered, single-engined model or a lightly-loaded twin with a pair of 19's (such as the C-46 Commando, also presented here). Directions for the glider construction are given first and in greater detail, since it is the more unusual of the two airplanes.

Construction

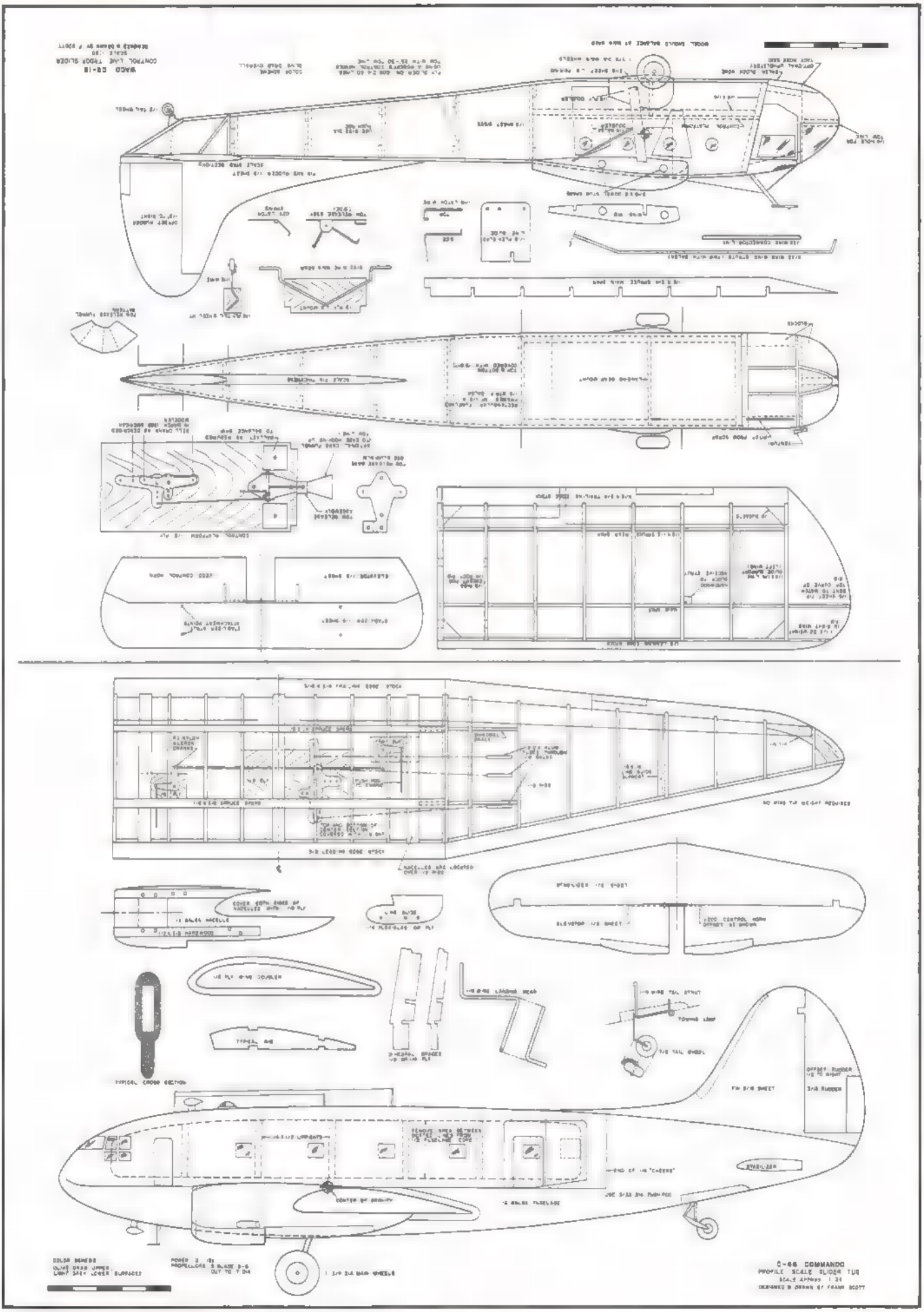
The CG-15 was chosen for modeling instead of its better-known predecessor, the CG-4a, because the CG-15 with its shorter wing and less complicated landing gear seems more suited for control line flying. Since I have a large factory drawing of this machine, scale fans may be interested to know that this model is essentially scale, even to the point of using a scale airfoil section.

Construction is not at all complicated. Although the model has no pounding engine trying to shake it apart, use as much care in its building as if it did, for it weighs as much and has much the same flight loads as the airplane pulling it. Begin by gluing the doublers and uprights to the fuselage sides. While they dry, bend the landing gear and attach it to the landing gear mount.

(Continued on page 63)

Third-line control in glider is essential for releasing tow line. Two pilots needed.

With the Commando, always start left engine first, especially if you are right-handed.



FULL SIZE PLANS AVAILABLE—SEE PAGE 70

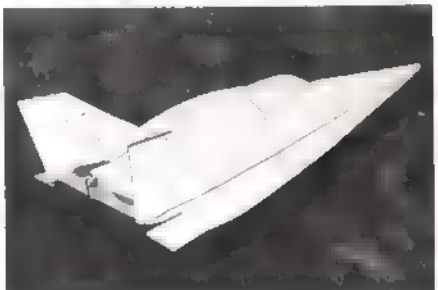
WHERE THE ACTION IS

RADIO CONTROL

SPORT AND PATTERN

RC In Research and Development: An entirely different facet of this hobby is an increasing use of RC equipment and design for experimental programs. Radio control has been used for years for testing model prototypes of full-scale aircraft designs. A good example is the large plastic flying boat that Lanier created for Lockheed.

Current activity at Wright-Patterson Air Force Base (Dayton, O.) includes a model program headed by Val Dahlem of the Air Force Flight Dynamics Laboratory. It is aimed at subsonic flight-testing of a lifting body space re-entry glider design. This is no ordinary airplane and hardly seems capable of flight. Development work is being conducted by both the Air Force and NASA to create a space vehicle design which can withstand re-entry into the atmosphere and yet be maneuverable and controllable enough to fly to a selected area for a safe landing.



This unusual thermal soarer is a lifting body RC glider used in Air Force re-entry research. Weighs 30 lb., controlled by a Kraft.

One of the most unique features of this program has to do with the launch technique. The proverbial skyhook has always been joked about, but I never saw a real one until I became the model pilot for this program. The skyhook actually is the end of a 1800-ft. dacron line attached to a Cessna aircraft circling at an altitude of about 800 ft. This is a program in itself, called Long Line Loiter, and is headed by Lt. Col. John Simons of WPAFB. Its purpose is to permit deposit and retrieval of devices in rough terrain where aircraft can not land.

In operation, the aircraft flies over the desired spot and trails a weighted 1800-ft. line. The plane then goes into a circle at about ___ ft. By adjustments in circle diameter and altitude, a skilled pilot can deposit the line's weighted end on the ground at zero velocity. In the model program, the model then is hooked on and restrained as line tension is increased by adjustment of aircraft circling diameter. It is then released; the aircraft discontinues circling and off it goes like a shot! It is then towed up to any desired altitude and released.

The model, built of balsa, is over 90 in. long and weighs about 30 lb. The control system is a six-channel Kraft single stick. Primary flight controls are aileron, coupled twin rudders with paralleled servos and twin elevators with paralleled servos. An additional pitch control system is gained by coupling the right and left lower rudder sections to move in and out together. This seems to provide as much pitch authority as the primary elevators. Additional controls are a radio-actuated tow release mechanism and a parachute recovery system. The Kraft system has worked fine and control during tow and in free flight has been demonstrated.

Model Safety: News items in the **Los Angeles Times, Denver Post,** and Dayton daily newspapers have told of near-miss incidents between radio control model airplanes and full scale aircraft. The Dec. 13, 1970 **Denver Post** reports incidents in Los Angeles and Abilene, Tex. However, the only officially recorded near-miss, between a model and a helicopter, occurred in Orange County, Los Angeles. The **Denver Post** article reads in part, "The FAA, which regulates all commercial and private aviation, has rules for kite flyers, balloonists and parachutists—but ___ for model aircraft. . .however, that may change. The FAA is beginning a study of whether rules are necessary."

I am in no position to judge the accuracy of the reporting, but we don't need publicity like this. Such incidents make good copy since the public is air-safety-minded these days. Therefore, we must make every effort to be super-safe and give ___ cause for such reports. If the hobby is to survive, we must stay far away from airplanes, people and houses.

Engine Vibration: A single-cylinder engine cannot be perfectly balanced, but vibrations can be reduced by counterweighting and lightening the reciprocating parts. Vibration loosens mounts, fatigues and breaks wires, cracks finishes, loosens control surfaces, etc. Twins, Wankels, rubber power or vibration-absorbing mounts can drastically improve the situation. Years ago, Al Greer in his Dragon design used radio-equipment Lord mounts for engine vibration absorption—with limited success. Hal deBolt's kits supplied rubber spacers for radial engine mounts to help take out vibration.

The Port Arthur Radio Control Club (The Oily Birds) newsletter, "Squawk Sheet," reports ___ good experience with the CHOPP nylon engine mounts. Two months and hundreds of flights with no engine loosening and ___ cracks seem convincing evidence of vibration absorption. This opinion was reinforced when the same engine on solid aluminum mounts was used on another airplane and resulted in engine loosening, plastic cracking, hatch loosening, etc.

Construction Derby: Top O' New Jersey RC Club newsletter, "Top O' The News," reports on a Construction Derby to stimulate members' creative efforts. Prizes will be awarded in four categories: Best Pattern Ship, Best Other Type, Best ARF, and Best Creation by Builder Under 21 Years of Age. Simple rules specify a three-month building period during the winter months and judging thereafter. Sounds like fun and a stimulus to turn out something special for the flying season.

Sort-of-scale sport model at French unique plane contest. Note hidden engine.

Homemade canard at the French Aeroclub ___ Cigognes "Cirque 1970" event. Nicely styled model should ___ a fine flyer.

French modeler's version of Bell Hovercraft uses two 60's. Successful model was presented in Radiomodelisme magazine.

Crazy Coat Hangers: Brian Fairey suggests yet another use for wire coat hangers. He cuts off the hook, bends small loops in the extremities, and forms the hanger into a square U shape which he nails to basement ceiling joints for storage of models. Coat hanger wire also can be used as aileron horns. The wire is stiff enough for this purpose and has the additional advantage of bendability for trim adjustments. To Brian goes the Coat Hanger of the Month Award: 10 billion excess coat hangers from my closet!

DON LOWE
GENERAL CORRESPONDENT

PYLON RACING

Winner's Advice: The AMA Competition Newsletter featured a discussion by Whit and Bob Stockwell about flying the pylon race course. Regular followers of pylon racing will recognize Whit as the 1969 NMPRA Grand Champion and top 1969 Nats qualifier. Bob identifies himself as Whit's pit crew, caller and editor.

With the 1971 racing season coming up, [illegible] would all do well to listen to Whit and Bob.

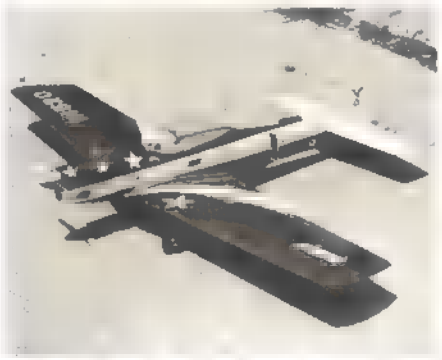
"When Gerry Nelson invented RC Pylon Racing, he came up with an idea which has grown to dimensions that he could hardly have foreseen. Racing has an advantage over Pattern flying that especially appeals to us, because a kid in school just can't get in the amount of practice needed to be really good in pattern; but the only practice for racing is racing itself.

The time you need [illegible] not on the field during the day but on the workbench at night. You win or lose in racing [illegible] much as by how you prepare [illegible] by what you do [illegible] the race. The first time a wheelpant binds up on takeoff you're out of that heat; and far more races are decided by zeroes than by firsts. One zero hurts as bad [illegible] four seconds.

In our best race of the year, when we won at San Marcos, we had four seconds to Joe Bridi; but though he won 13 out of 15 heats, he had two zeroes. In the West Coast Championships, Larry Leonard (1st in Finals, Formula I, 1969 Nats) had four firsts and one zero: [illegible] came in 11th.

Leaving out cut pylons, the zeroes came from failure to finish ten laps. Engine start and [illegible] tendency to nose over on takeoff are the most common reasons for failure to get off (occasionally accidents will knock you out of it).

Failure to start an engine is almost always carelessness. Check the plug, check the head



NMPRA No. 1 is Pappy deBolt. He's improved his old retracts, and made a neat installation in one of his P-51 FAI planes.

screws, check the fuel line, check the prop and spinner, every time before going to the line. You won't nose over if you'll sacrifice a little ease in landing and put the gear well forward of the CG. Landings are better with the gear close to the CG (they don't tend to bounce), but takeoff is more important. You want [illegible] solid roll with no tendency to go over, even if your caller shoves it as hard as he can. And be sure the wheels roll free under pressure—not just by turning them over with the fingers. It's better to sacrifice the scale points and race without wheelpants than to take [illegible] chance on zero. First time a landing knocks them even a little loose, take them off, inform the CD [illegible] he can readjust your handicap, and race without them.

Failure to finish ten laps, assuming [illegible] radio failure and no midair, is almost always because that needle valve was tweaked. You can't set it at the beginning of a contest and figure it will stay put. The air changes through the day; the humidity rises or falls, or both. Our practice is to back the needlevalve off to dead rich every time and then bring it in slowly to just the right pitch, a pitch you can learn only by listening carefully to your engine and others. We don't carry a tachometer to the line. The ear is sensitive enough, if you train it.

We've been accused of sandbagging on the starting line because, with two minutes to start, we wait until we're sure the others [illegible] starting satisfactorily. If you start right up and someone has trouble, you may be the one in real trouble when your engine overheats.

Everyone has the same two minutes and can place his bet where he wants to. If he's confident he can start, and he's not sure the others can, then it is his fault if he doesn't wait. This business of yelling out for everyone to start and getting mad when they take the chance of waiting (which will certainly get them [illegible] zero unless they've gambled right on now well-prepared they are) is no good."

New Products: Quite some time ago [illegible] recommended finishing balsa surfaces with [illegible] two-coat coating-resin system, one of the easiest methods to prepare an excellent base for Hobbypoxy Colors. Shortly after that supplies of coating-resin began drying up and we heard that Starcast [illegible] given up marketing this product. Francis Products, Box 874, Cupertino, Calif. 95014, has come [illegible] the rescue and packages [illegible] excellent resin, Surface and Finishing Resin, [illegible] $3.95 a quart. We have tried this resin and do not hesitate to recommend it.

[illegible] MORSE
SPECIALIST CORRESPONDENT

GLIDERS AND FAI

FAI Fall Meeting: U.S. representatives won full approval for the proposed 1971 RC Aerobatic World Championships to be held at Bucks County Airport, Sept. 15-19. (Site is [illegible] Doylestown, Pa., about eight miles north of Willow Grove N.A.S.) Fourteen countries already plan to send teams; AMA expects that as many [illegible] 20 countries will be represented.

European teams will be brought over via chartered jet, and these costs, as well as others connected with meet, will be high. Quite [illegible] few RC clubs and individuals already have sent contributions to [illegible] RC/WC Fund, but many more will be needed.

No changes [illegible] made in the FAI Aerobatic rules. The U.S. proposal to convert provisional FAI Pylon rules to official status was approved. While these rules haven't stirred much interest in the States, many meets have been run in England, South Africa and other countries. Few rules changes [illegible]re made in this category, none affecting the model specifications.

Despite vast European interest in RC gliders and fast-growing U.S. activity, FAI glider rules remain only on provisional basis. Changes now allow [illegible] 300-meter towline; maximum score will be 600 points for a ten-minute max., but one point will be deducted for each second flown over ten minutes. These rules probably will be used in the U.S. gliding competition.

AMA Glider Rules: At last report, only eight replies had been received from RC contest board members on the question of establishing RC gliding [illegible] [illegible] provisional AMA category. All were in favor, so it seems likely this competition will become official in 1972. Rules have not been settled, but LSF rules proposals may [illegible] accepted as official for the entire country, at least for 1971.

SOAR Organized: Twenty Midwest glider enthusiasts have formed the Silent Order of Aeromodeling by Radio, an RC glider group. The majority of them organized or flew in the 1970 glider meet held during Nats week. A good slope soaring site has been found about two hours' drive from Chicago. It is [illegible] 150-ft. bluff in Buffalo State Park, just west of Ottawa, Ill. A large flat area atop the bluff is [illegible] perfect landing spot. Two-hour slope flights already have been made there. SOAR contact man is Dave Burt, 3048 Central Ave., Evanston, Ill. 60201.

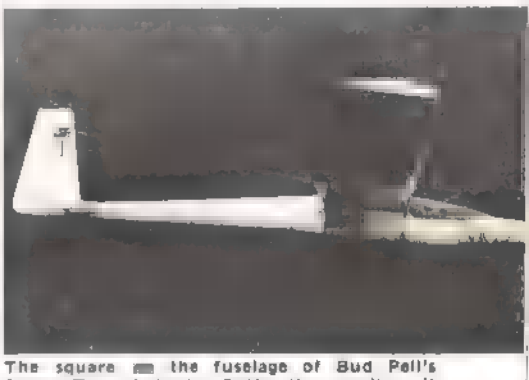
Dave says his glider winch (p. 12, Feb. 1971 AAM) is working fine, but [illegible] improved upwind pulley has been developed. The original pulley gave trouble at the Nats glider meet.

North Wins Taft Civil War!: A glider meet between fliers mostly from the Los Angeles and San Francisco areas was billed as [illegible] RC Sailplane Civil War and was flown off at Taft, Calif. The Northern team won by [illegible] considerable margin. Top five placers from each [illegible] were counted to arrive at the team score. Twenty-eight entries came from the South and 17 from the North. Apparently, the lighter thermal soarers of the northern group outfloated those of the Los Angeles area contingent. The latter go in more for faster, heavier slope gliders. Team spirit was strong and a 1971 repeat of the event seems inevitable.

The South's teen-ager, Eric Averkieff, captured top place in the non-scale flying, while John Donelson of the same group won the Scale event. He flew [illegible] V-tail Cirrus. The South Bay and the North Bay Soaring Societies furnished most of the Northern fliers, while the Harbor Soaring Society predominated from the South.

New Glider Mag: First issue of the official journal of the East Coast Soaring Society, with ten pages of halftones, drawings and technical articles, has a professional look. The ECSS Newsletter goes to all members, but others who may wish to keep current with RC gliding in the East can obtain copies from ECSS (8306 Frement St., New Carrollton, Md. 20784).

Reducing the Walking: Members of the Greater Detroit Soaring and Hiking Society (whose club emblem shows [illegible] glider superimposed upon the bottom of [illegible] well-worn shoe) [illegible] doing [illegible] lot less hiking to



The square [illegible] the fuselage of Bud Pell's Soarer [illegible] [illegible] air brake. Better than spoilers, it does not ruin the normal glide.

retrieve their winch towlines these days. Instead of the piece of rag usually used on winch and high- start lines, they employ [illegible] small parachute. The glider end of the line (using [illegible] winch) can [illegible] made to drop almost at the starting point. Presumably the line [illegible] pulled off the winch reel by hand, as the chute is dropping. Bud Pell of the GDSHS says that by using chute instead of rag, walking has been cut to less than half. At first members made their own chutes, but they found the Graupner chute works fine (kit costs $4.95).

[illegible] [illegible] another hint of real interest. The air brakes he has added to his original HP-1 glider are [illegible] [illegible] x 4" flap hinged to each side of the fuselage under the wing. They open about 70 degrees, by means of [illegible] extra servo in the plane. The results are worthwhile, although the flaps probably are not [illegible] good as spoilers [illegible] the wings. However, they certainly are much easier to add to an already-built glider. Flap hinge points are under the center of wing chord (flaps open forward) and, when opened, they cause nose-up tendency. Perhaps if located farther forward, not so much elevator correction would be required.

New U.S. Glider Kit: Astro Flite Inc. (designers of the 75-in. span Malibu glider which made an FAI closed course duration flight of 187.6 mi. in Hawaii last August) is marketing the 100-in. Monterey.

HOWARD MCENTEE
SPECIALIST CORRESPONDENT

ELECTRONICS ■ AERODYNAMICS

The Fascination of Integrated Circuits: In recent months, we have been experimenting with integrated circuits (IC's), after observing their use to varying degrees in certain radio systems we reviewed. Maximum use of the IC's seems desirable because of their reliability. The designer's task becomes one of proper selection, observance of circuit input characteristics, and IC output loading.

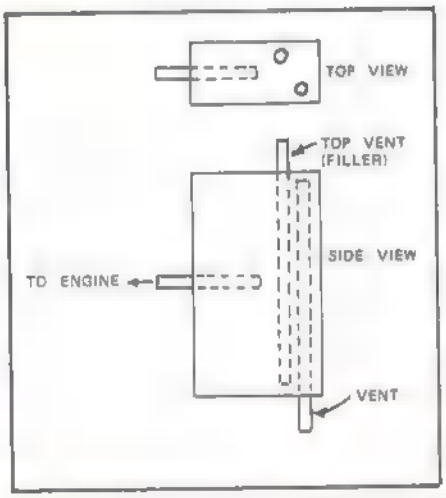
Wading into IC's without some knowledge of the nomenclature is bewildering. A whole new family of terms is encountered: RTL (resistor-transistor logic), TTL (transistor-transistor logic), gate, hex inverter, MOS (metal oxide semiconductor), and so on. An excellent set of articles, "Basic Course in Integrated Circuits," by Robert G. Hibberd of Texas Instruments, Inc., and reprinted from **Machine Design**, is available from the Penton Publishing Co., Cleveland, Ohio 44113, for $3.00. This booklet is interesting and highly recommended for those who wish to learn about IC's.

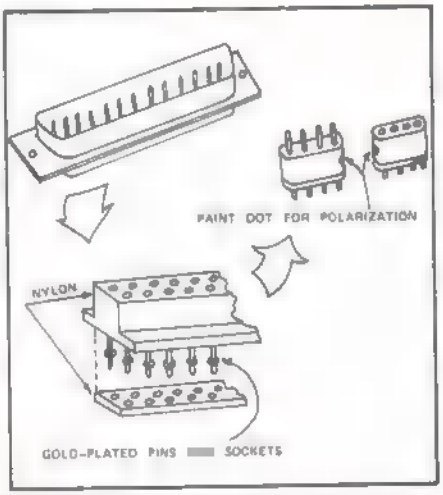
In future columns, more information will be presented on the application of IC's to radio control, culminating in a discussion of an IC transmitter and decoder for car and glider buffs.

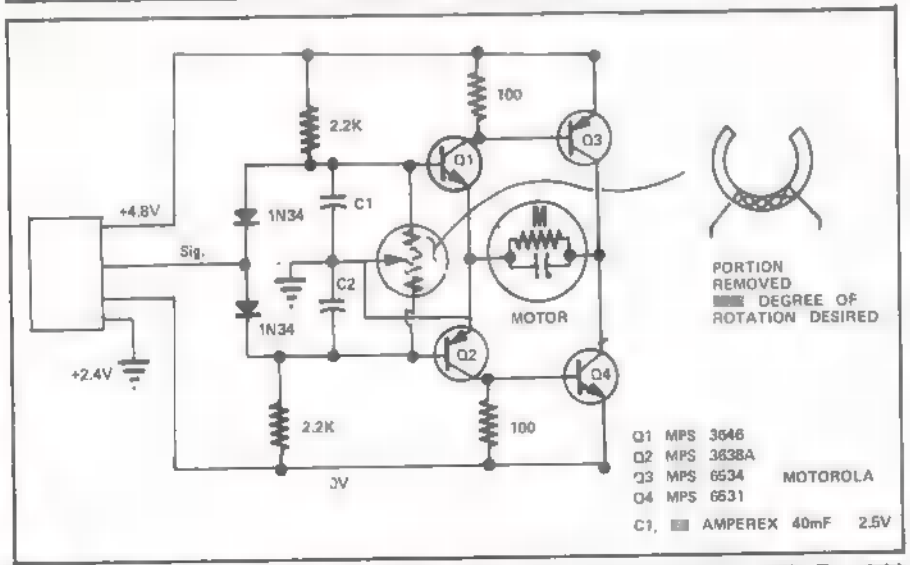
POD? What's ■ POD?: A friendly scolding from Dave Fraser reminded us that not everyone knows pulse systems and their terminology. The term POD was used without a definition in two recent columns covering the use of a POD with the S4-a servomechanism. A POD is ■ Pulse Omission Detector, used for years to obtain ■ additional function from pulse systems. Pulse systems are described in detail in the March 1971 **AAM**.

More Flexibility for the SS-3 POD: According to Stewart Meyers, "The Marks SS-3 POD fits into a World Engine's S4-a servomechanism with only a light pass of ■ file on the printed circuit board. By removing the resistive element from the potentiometer over the angle of rotation desired, connecting the potentiometer end terminals to the bases of the detection transistors, and the wiper to center tap, a nice built-in limit is provided which draws only a milliampere in the extreme positions. This is electrically applied to reed servos."

■ This excellent suggestion is applicable to any pulse system which makes use of a 4.8V, center-tapped battery pack. But don't try it for digital POD. It won't work that way because there is no way to provide "full signal on." Since the digital pulse train is already present, POD for digital can be only signal off.







Top left: Simple Stunt tank by Tom Sanders used on 020 Galloping Ghost models. Top right: Cheap and readily available connectors with non-tarnishing gold contacts made from old Cannon plugs. Above: More flexible application of SS-3 POD uses modified pot elements.

Connectors from Canada: Brian Fairey has an idea for ultra-cheap, highly reliable connectors having gold-plated pins. Used Cannon, Winchester, and other connectors are readily available from electronic surplus stores. The following procedure is used. Cut off and discard the metal frame which holds the connector components together. Remove the pins. Using a razor-saw, or heated model knife blade, cut the desired connector shapes from the large connector. Reinsert the pins and join the nylon parts. This may be done with Silastic (bathtub sealant from the local hardware store or by carefully "welding" the nylon with carbolic acid and a small brush. Avoid getting carbolic acid on the pins, and wash and dry the unit thoroughly before using.

An Ultra-Simple Stunt Tank for Small Models: This tank was devised by Thomas Sanders. Tom has been working on a small 020-powered galloping ghost (66) stunt plane, having aileron and elevator control and a symmetrical airfoil. He hopes that it will be capable of inverted flight and, therefore, it needed a suitably small stunt tank. A clunk-tank arrangement proved unsuitable, so he designed his own. As long as it is more than half full (or perhaps not more than half empty?), the engine will draw fuel regardless of aircraft attitude. The tank is designed so that half a tank produces the desired run time. The 1/2 x 1 x 1 5/8" tank gives a run of ■ 1/2 to ■ min. on a Cox Pee Wee. The only disadvantage is that half the fuel remains in the tank and must be drained at the end of each flying session.

FRED MARKS
SPECIALIST CORRESPONDENT

RC CAR RACING

Vibration Prevention: Car radio receivers have had problems because of excessive vibration which destroyed anything but the best solder joints. In addition, metal rubbing metal and high frequency vibrations sometimes have created spurious signals which can cause unexplained glitches. The solution has been to wrap the receiver in foam rubber, which was fine as long as there was plenty of room in the car. But ■ low-slung Indy model has no room to spare.

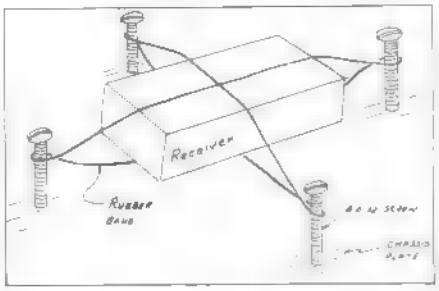
The latest technique for preventing vibration is ridiculously simple. Mount two or more one-in. long bolts on the chassis so that they are held by their ends only and by means of jam nuts. Suspend the receiver between the bolts, using rubber bands which cradle the receiver and cushion all shock and vibration. (For details, see drawing.)

Radio batteries (and even gas tanks) can be suspended in a similar fashion. Use several rubber bands so that if one of them breaks the receiver is still evenly suspended between the bolts.

ROAR Rules: The great debate over racing rules and car specifications is over. A vote, taken among ROAR members, made the decision on each rule ■ choice by a majority of the racers themselves. For a copy of the 1971 rules, send a self-addressed, stamped envelope and 25 cents to ROAR, 2855 Velasco Lane, Costa Mesa, Calif. 92626.

Radio Multi-Frequency: More and more radios are being converted to multi-frequency operation, which means five crystals are mounted in the transmitter. One pole of each crystal is connected individually to ■ single pole, multiple-throw selector switch whose common terminal is connected to the other crystal socket. Thus, any transmitting channel can be selected at will.

Two things are important. Use very short wires for connecting the selector switch and use the proper color frequency flag for each channel change. A similar arrangement can be



Rubber band mounting protects receiver from all shock and vibration. Foam surrounds receiver to limit movement in crashes.

made for the receiver in the car, thus providing a complete selection of transmitting frequencies, so that no race need be missed. Observe correct RC etiquette at all times and do not fiddle with the selector switch.

New Products: An interesting new product is a cloth band to be mounted on the transmitter back so that the hand cradling it has a better grip and feels more secure. Price is $1.85, from Taran Products, 466 Giannini Drive, Santa Clara, Calif. 95051. They also have a novel servo mounting pad which breaks loose only in a severe crash and can be repositioned in a jiffy.

K&B recently released a new engine specially designed for cars. The cylinder head has deep fins which are aligned so that maximum cooling occurs when the engine is installed in a car. This is the updated version of the popular Veco 19 engine; the price is around $30.

Nor/Car now has a heat sink which can be mounted on any engine. It has deep fins and is made from aluminum. It can be installed in a matter of seconds when an engine is not dissipating enough Btu's. Write to Nor/Car, 13527 Debell St., Arleta, Calif. 91331.

Nationals: The 1971 Nationals will be held July 3 and 4, in the Washington, D. C. area.

New Clubs: Contact the following: Jerome M. Willis, 5315 E. Broadway No. 104, Tucson, Ariz. 85711; Ronald Crow, 610 Hoffman, Corpus Christi, Tex.; J. R. Dankers, 101 Morian St., Clayton, Victoria, Australia (3168); Richard Bowman, 121 Tupper Cr., Apt 6, Kitchener, Ontario, Canada.

GEORGE SIPOSS
SPECIALIST CORRESPONDENT

Remarkable CL scale rocket-powered Russian model. Winner in recent Moscow contest.

Landings in grass frequently result in nose-overs. So drop the gear at takeoff. Looks better in flight too. Art Oberstaedt shows how on profile Mustang.

CONTROL LINE

SPORT AND SCALE

Air Force Self-Help: Those amazing young men with their flying machines at the San Vito Dei Normanni Air Station (Italy) recently learned the value of the Air Force Self-Help Program, when they undertook to transform their dusty model airplane flying circle into a concrete launching pad.

The Air Force provided materials, and the 20 members of the San Vito Modelers graded, cast forms and laid several truckloads of concrete. Upon completion of the month-long project, the transformation was remarkable. The once vacant lot, enclosed by a wire fence marking the club's flying area, now has a 60-ft. dia. circle, complete with an assembly pad.

The San Vito Modelers Club began when a handful of model airplane enthusiasts got together to practice their favorite hobby in an empty field. The club now has more than a score of members flying approximately 50 planes. Membership is growing and so is enthusiasm, thanks to Self-Help.

Balsa Does Fly Better: So reports George Swanson, Utah State Aeromodelers. His opinion is based on the Club's recent Orange Crate Derby. A fly-for-fun event, it is just what the name implies—flying planes made from the wood of orange (the eating kind) crates. Contestants must come to the field with the necessary tools and gear to build a plane from scratch, get the ship airborne, and be the first to complete ten laps.

Rules for building Crates are simple. All wood is supplied at the site to contestants, who bring tools and other supplies (hammer, saw, drill, nails, music wire, wheels, staple gun, etc.). No prefabrication is allowed, except for the control system and perhaps landing gear salvaged from a previously wrecked plane. No pretesting is allowed. As soon as completed, the Crate is flown—if the builder is lucky. If not, back to the drawing board.

George took first place with a total elapsed time of 32 min. from the start of building to completion of the required ten laps. His fantastic design of 3/8" pine had a span of about 30 in., length about 24 in., and no rudder. It was held together with 3-in. nails, had a single-wheel landing gear, and used a Cox 15 engine mounted with plenty of offset to keep the crate out there. Elevator/stab sections were held together with nylon hinges nailed in place.

Jim Rhoades, with a flying wing design finished second, just two laps behind George. Bob Gardner finished third with a somewhat cranky engine. To the rest—better luck next time.

Scale—Russian Style: Peter Chinn of England reports on what must be one of the most spectacular CL Scale model planes built to date. It is a Russian Tupolev TU-16 (Badger), 75 in. long, with a 70-in. wing span. This most impressive effort showed great detail and workmanship. Built and flown by a team of Moscow modelers (Tunik, Sikolov, Sirotkin and Yurchuk), the model won the scale class at the 1970 Soviet Nationals. Yuri Sirotkin, the plane's pilot, is a former World Stunt Champion and also heads the team.

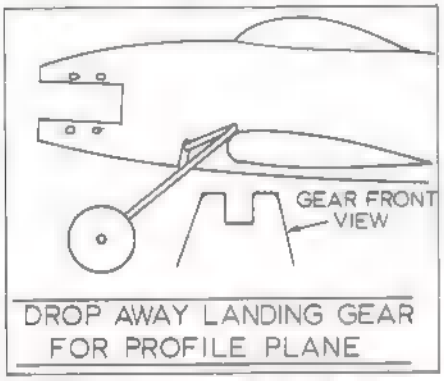
The plane was powered by two rocket motors which delivered a little more than four lb. of static thrust each and were capable of being throttled. It would be great to have an engine like this available on the American modeling market. Think of the new subjects in jet aircraft which could be modeled.

If Flying Boxcar is good, why not a flying Locomotive? Took first for Augie Buffalano at unique plane meet. Engine exhaust even goes up the stack. Drops coal in flight.

Orange Crate Derby again proved that balsa flies better. Note the fine detailing and craftsmanship. They all flew—more or less—at Utah State Aeromodelers contest.

Do-it-yourself flying circle under construction by members of San Vito Model Club in Italy. Manicured grass infield. USAF Photo.

Drop-away Landing Gear: Art Oberstaedt gets better flying characteristics and more speed from his profile planes by allowing the landing gear to drop away after takeoff. This is done by cutting a slot in the bottom of the fuselage about 3/4 in. in front of the wing's leading edge. The landing gear wire is bent so that it can be placed in the slot and at the same time rest against the wing's leading edge. The plane's weight holds the gear in place



Art Oberstaedt's dropping landing gear leans on wing leading edge. Note clever bending.

while on the ground. The gear drops away once the plane is airborne.

Welcome to the Fold: Lorna Karlstad, secretary of the newly-formed Everett Line Kinkers M.A.C. (Everett, Wash.), reports that the club, established in Sept. 1970, already boasts 17 members and is involved in contest work. It has held hand launch glider and .049 Combat meets. Its main activity, however, is clearing a flying site provided by the Washington Air National Guard at Paine Field in Everett.

Abilene AAA Meet: Jerry Farr of the Key City Prop Twisters (Abilene, Tex.) announces that their big AAA Meet will be held June and 27, at the Old Airport site in Abilene. Nine CL events will be offered with awards to third place and Hi-Point awards for each age category. Speed Record trials are to be held both days. Bleachers and concessions are available for contestants and spectators. For full details, write Jerry at 2625 S. 27th, Abilene, Tex, 79605.

BILL BOSS
General Correspondent

SPEED AND RACING

More Equipment Suppliers: Complete 1/2 A equipment, such as pans, wheels, and canopies for proto, is available from Dale Kirn, 283 N. Spruce Dr., Anaheim, Calif. 92805. Dale's new fiberglass proto fuselage shell is available at $5.00. It mates with Cox mag pans and weighs 5/6 oz. Dale also can supply lefthand crankshafts for Cox engines and his fine proto prop. By using parts from one supplier, a record-making proto model can be built "off the shelf."

Jim Wade did and he has six record certificates for proof. All records were set during 1970, which was quite a busy season for this junior flier.

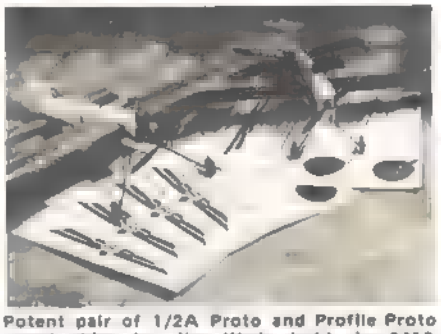
For the bigger-engined models, check with John Tatone, whose excellent products for FF and RC are well-known. He also has a full line of equipment for the speed flier. Full pans are offered in 1/2 A, A, B, and C sizes, half pans in 1/2 A proto and B proto. He will drill and tap pans to order for an additional fifty cents. Specify engine model number, displacement, and year, and include mounting bolts. His pans are polished, light aluminum alloy castings, lengthened to accommodate rear mounting for tuned pipes. Three sizes of pen bladder tanks also available from Tatone.

For engine rework, check with George Brown, Brown Specialties, Staten Island, N. Y. Phone is 212-727-2194. George can really make an engine go, as anyone who seen daughter Mary Lou fly will tell you.

A sample speed dolly (see last month's column) from Walter Brassell had flawless workmanship. We tried it with two of Fred Randall's A jobs, making a few minor bends with the pliers for a custom fit. Fred used the dolly at the King Orange Meet but didn't get to give it a real test. This beautiful unit should find a spot in the speed circle.

More on the King Orange Meet: Fred Randall reports that it was a cold, 58-degree, slow meet and speeds were low, low, low. Top in Open A was 123 mph. Second was below 90! All the good guys were th but went fast. Fred's one good run in A was done when it was almost dark. The airplane got of him and he had to come out of the pylon to save it. The timers told him they couldn't see it anyway.

New Rules: The line size increase did not go through. Stranded (braided) lines will not be allowed in Rat Race. Handle on chest is allowed in Goodyear. Two-man pit crew in Goodyear, pilot must remain in center for starting but may help on restart. Figure that out! Thongs must be used in speed. CD's read this: pull tests must be made with scales hooked to the thong. So no shoe strings, gang. It won't work.

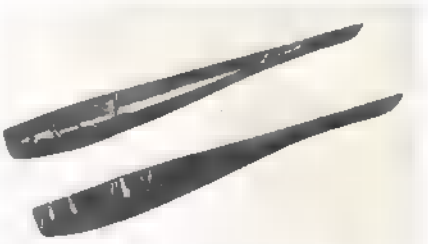


Potent pair of 1/2A Proto and Profile Proto speed ships by Jim Wade hold six AMA records.

CL Saftey: In some the AMA pull test is not being enforced. Fliers tell me CD's and event directors are setting up lower pull tests, some as low as 20-25 G's. The book calls for 40 G's for speed. Use it! While the lower pull test may be enough in some cases, if a breakaway occurs this lower pull test, AMA insurance is void. It is written according to the rule book's safety requirements.

The Competition Newsletter (AMA—Mid-December, 1970) backs up my feelings. James A. Kloth wrote, "The failures that have taken place can be dropped directly in the laps of the people responsible. These are the contestants who try to use damaged lines and the officials who not check them, thus allowing their use. My experience over the past ten years has shown the pull test to be the exception rather than the rule. Diameter is checked only when there is a possible record claim. A visual inspection is never made."

Why do clubs run meets this way? Will it take a really bad accident to open up some eyes and ears? I hope not. My suggestion (which may make a few enemies) is to notify the meet CD of unsafe practices in the Speed circles, Rat Team Race circles. If he does not correct the problem, notify AMA. CD's are responsible for running meets in safety, and with fairness and common sense. AMA insurance is based on these principles.



Tatone Speed pans are available for many engines and be ordered drilled to specification. They long enough for rear exhaust and pipes.

Pictures Needed: Now that the circles are open, let's see some good black and white photos from the Rat Racers and the Goodyear Racers. Don't keep all the "go fast secrets" to yourselves. How do you expect competition, if you don't tell them how?

I can use club papers and ideas. Most of you have a short cut or two, so let's share them. Items are worth five dollars if used.

New AMA President: Jovial Johnnie Clemens was elected 1971 AMA President. This tall (5' 6") Texan will do a bang-up job running our organization, so let's give him all the help we can. Congratulations, President Johnnie, from all of us toy airplane fliers.

This and That Department: With the weather getting nicer, look around the neighborhood for kids who have ready-to-flys they received for Christmas and which they out trying to get in the air. A few minutes spent showing these kids how to start the engines, telling them not to store them with fuel in the tank (which results in fuel line plugging), and giving general information about the airplane, will be eagerly welcomed. We can always more modelers, so help show them the right direction.

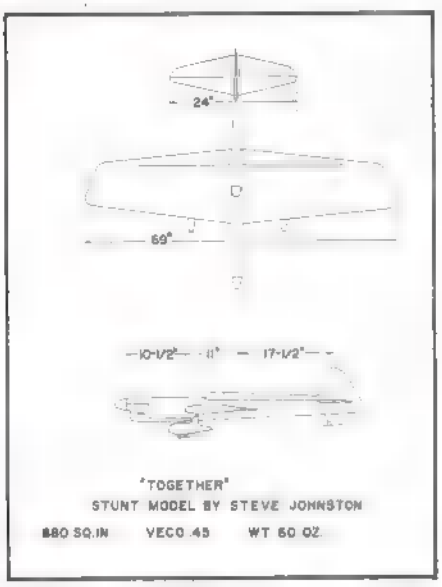
JOHN SMITH
Specialist Correspondent

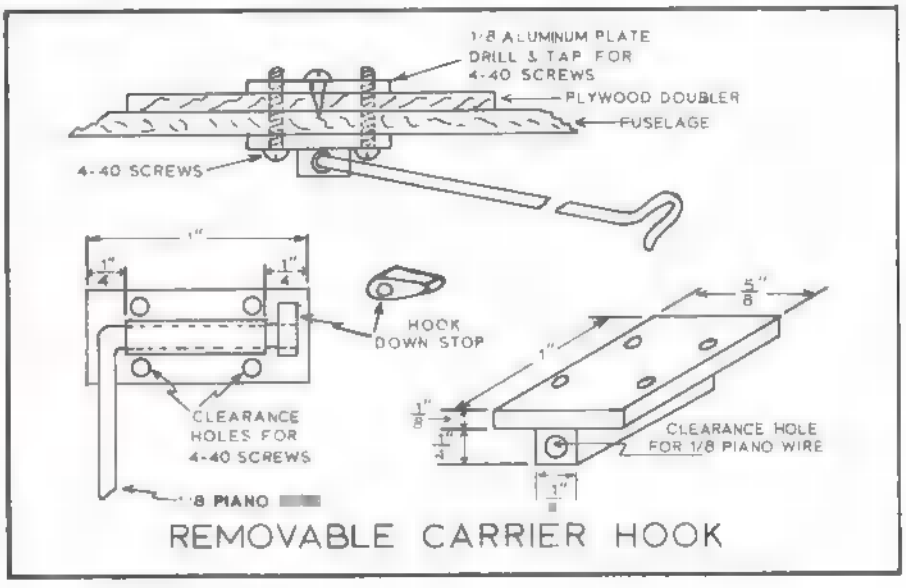
CARRIER AND STUNT

Removable Carrier Hook: Carrier fliers often would like to facilitate practice flying by removing the tailhook from a competition or sport model. But today's equipment doesn't permit this, particularly in the Scale Classes, and the hook presents a problem with touch-and-goes and engine adjusting.

Bill Boss handles the problem as follows: "Materials required to make the hook removable include a hard aluminum block 5/8 x 5/8 x 1", 1/8" thick hard aluminum plate 1/8 x 1", and a small piece of brass for the hook downstop."

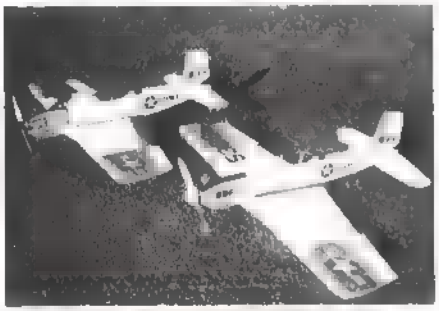
"The aluminum block is shaped, as shown, bu careful use of hacksaw and hand drill (milling machine equipment would make the job easier). After the block is shaped and drilled, a hook of the proper length (for the plane in which it is to be installed) is inserted in the block and the downstop added. Position the downstop so that the hook is held at the proper angle for landing and solder in place. If desired, a spring can be added to the hook for more positive downward action."

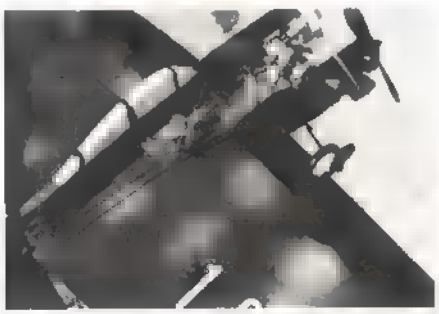




"Mounting the hook depends on the plane's structure. The method shown was used in a Sterling Guardian, where plywood doublers were epoxied into the fuselage. Tapped aluminum was held in place by a small woodscrew and several drops of epoxy. Releasing the hook depends largely on the plane and the design of the flying control system used."

Make That Bellcrank: David Engel handles the throttle control bellcrank situation quite economically with a throttle crank made from two Veco three-in. bellcranks. The upper crank satisfies the intended purpose of up and down and is mounted in the end of the lower bellcrank. The lower crank then is mounted to an aluminum plate and with a third line works the engine throttle. Placement of the upper crank can be worked out proportionally as a Roberts handle can be used. Commercial throttles, such as that used on Dave's Enya 35, require less throw than the custom slides found in most Carrier engines, thus making this application possible.


Frank Kelly's T-34 Profile Carrier models.


Another simple homemade three-line bellcrank system on a Carrier trainer. Would you believe a Sterling Navion? By David Engel.

Stunt Model Drawing: Steve Johnston's 69-in. span model, Together, was named after a hard rock music group. The design offers many of the desired flying characteristics in square manuevers, without wobble in pullouts. Features include: 18% aspect ratio, 19.3% airfoil, 11-in. chord, and a 7-oz. uniflow tank. It handles well in windy weather at about 50 mph. Steve liked the looks of the Ares and related designs but stayed with the basic moments of the Nobler and Detroit Stunters.

He has many ideas on Stunt and has crusaded for the retention of appearance points in AMA Stunt. He also advocates the possibility of including this facet in FAI. He also wonders why Stunt should be penalized with the addition of mufflers while other events go unrestricted.

Father-Son Team: Realistic Navy Carrier profiles are produced by Frank Kelly and son Matt. Their T-34 design features 300 sq. in. of wing area in a 36-in. span. Frank's model weighs 2.6 lb. and is powered with a greenhead K&B 35 RC, while Matt's weighs 2.5 lb. and uses an ST 35 RC. Wings are solid construction of 3/8" thick balsa. One hundred seconds has been achieved on slow speed in competition, which averages to about 18 mph.

Tricycle gear helps on carrier landings by restricting the forward roll of the model when the tailhook grabs the arresting cable. Many 100-point landings have been reduced to lesser scores when the model pitched forward and then rolled back, releasing the hook. Quite often the model was in other than a three-point attitude.

Some modelers may not prefer this nose gear arrangement because the rearward position of the main gear keeps the model's tail farther above the deck. Some feel the odds for an arrested landing are more favorable when the tail is down. This remains a personal preference.

JOHN BLUM
Specialist Correspondent

FREE FLIGHT

SPORT

Scholarship Contest: Anyone less than 19 years old on July 1 may enter the Model Aeronautics Scholarship Contest to be held June 19 and 20. First prize is a $1500 college scholarship. Site for the second of these Boeing Management Association-sponsored affairs is the Boeing-Kent Space Center south of Seattle. The program includes six free flight events and five control line events. In addition, there are six specialty events: Indoor HL Glider, Indoor Easy-B, Rocket Quadrathon, Rocket-Swift Boost Glide, RC Class A Pattern, and Design Craftsmanship.

A maximum of three events in each category will be scored, and the best score in four events, according to a point system, will be combined to determine the winner. Events in the FF category are 1/2 A Gas, Unlimited Rubber, Outdoor HL Glider, Cargo, Helicopter, and combined A/1 and A/2 Nordic Glider. For further information write Mr. Herman Clegg, Organization 1-1835, Mail Stop 85-48, Boeing Management Association, P.O. Box 3999, Seattle, Wash. 98124.

Sharkie Nordic: This is the glider with which former Junior and Senior National Champion Dennis Bronco won the Nordic event at the Albuquerque Affair. Originally designed in 1961 by indoor gliderman Lee Hines, designer of the popular Sweepette, Dennis's is the only Sharkie ever built. Dennis took second place with it at the 1967 Nats, but entered the Army shortly afterward, thus making it impossible for him to enter the FAI Finals for which he had officially qualified. While with the Army in Germany, he attended the World Championships in Austria, which "really lit my fire," Dennis says. After his discharge in January, 1970, he checked with Dave Linstrum, FAI Free-Flight Program Administrator, who decided he was qualified for Albuquerque by virtue of his previous qualification. Next stop, Sweden!

Instant Free-Flight: "Would you believe that a model with no rudder, no stabilizer, no

dihedral, no fuselage, in fact, no vertical surfaces of any kind, would fly?" That's what Frank Ehling asked me at the Nats. Frank had built several himself and showed me an RC version built by a colleague. The flying-wing model shown was patterned after it. The secret, according to Frank, is the angle of the aileron hinge.

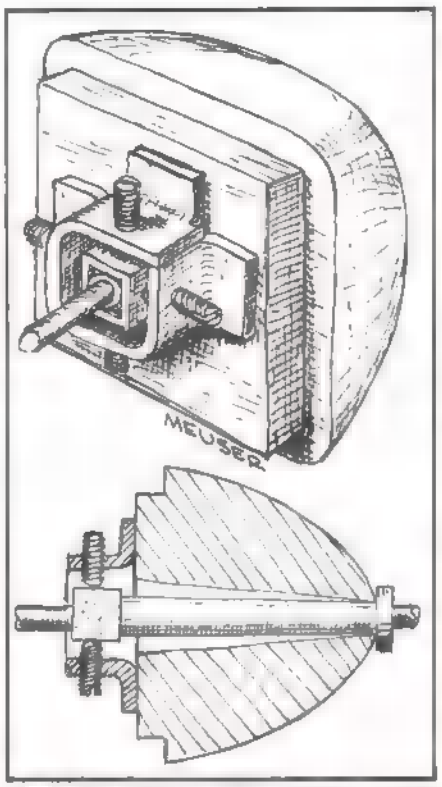
A true flying wing such as this can be quite an education—and a bagful of surprises. Try to make it turn by adding clay to a wingtip. It doesn't turn at all—just flies sideways! CG position is critical. If the CG is too far aft, even though the model may be trimmed for stable level flight, once the nose gets down the model will perform an outside loop. If the CG is too far forward, extreme up-aileron will be required for level-flight trim.

When the model is upset slightly, it goes into a series of zooms and stalls which never damp out. The model will fly with no camber at all, but a slight camber (1/16 in. for a 3-in. chord) both flattens the glide and slows it down. Sinking speed is comparable with a conventional glider of the same size and weight. Much more camber than that will make the model longitudinally unstable, regardless of the trim, it will either stall or dive.

All of these effects apply to conventional models too, but they are greatly intensified on a flying wing. However, lateral (roll) stability and directional (tail-wagging) stability cannot be separated to the same extent. With many flying-wing designs, negative dihedral in the tips produces a stabilizing effect! With such a simple model, a dozen different configurations can be tried in an evening.

Super Coupe: Some say: "The pretty ones don't fly any better than the ugly ones, so why bother?" Others "bother" because of the satisfaction they derive from doing something well. One of those who bothers is Don Typond, and his Coupe d'Hiver is one of most tastefully designed and carefully constructed we have seen.

Some of its gizmos would be an asset to models of almost any class. One of these is a sliding wing mount. Screws inserted in slotted holes in the wing shelf secure it to the pylon, while permitting a fore-and-aft adjustment of its position. We have all heard that a rearward CG position contributes to maximum duration in still air, but that such a model is easily upset, does not recover well, and is not responsive to light thermals. But how many have put that theory to the test on their particular model? Most modelers glue the pylon in place and never change it.



Four set screws give precise thrust adjustment.

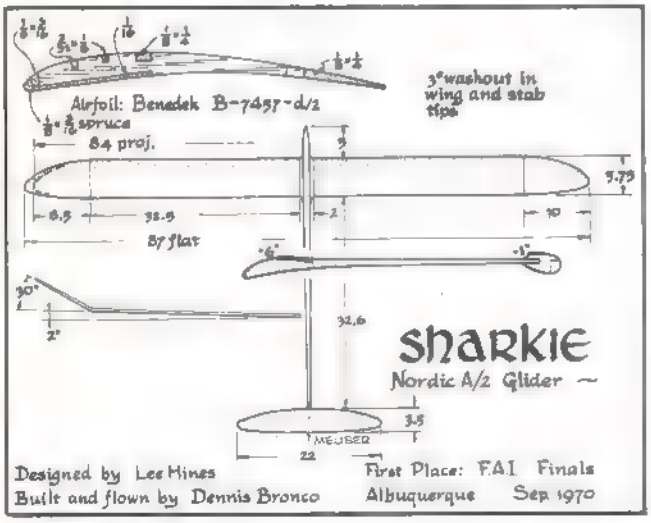
By sliding wing platform fore and aft, CG is effectively adjusted. T tail is out of prop wash of single-bladed prop. Note counterbalance position. Typond calls model Super Coupe.

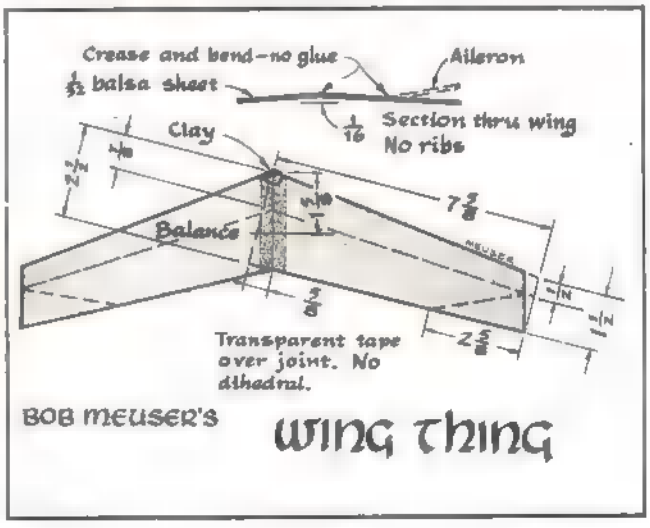
Another nifty is the balsa block with screw adjustment of downthrust and sidethrust angles. Certainly beats whittling nose block shims—and having them fall out at just the wrong time.

Another neat touch is Don's lettering, which is simply tissue cutouts doped into place, but each letter is outlined with India ink applied with a ruling pen. The outlining may add a half-hour or so to the construction time, but what a difference it makes!

Why the tee tail? No double-talk about getting the stabilizer out of the downwash of the wing. Don did it simply because he likes tee tails! A former editor of Private Pilot Don Typond spent 650 hours building the outdoor rubber-powered flying scale Wilga shown in the 1968 AAM Annual!

BOB MEUSER
GENERAL CORRESPONDENT





INDOOR

Indoor Flying Sessions: Dick Smola (650 Hoyt St., Painesville, Ohio 44077, phone 261-354-8260) has arranged to hold indoor sessions each Wednesday evening at the Painesville National Guard Armory. For fliers addicted to high ceilings, tentative dates have been arranged in the hangers at Lakehurst NAS, New Jersey, May 2, June 6, July 3-4, 1971. Contact C. V. Russo, 143 Willow Way, Clark, N. J. 07066, for more details.

Super Cub?: The AMA Cub, designed by Frank Ehling as a beginner's model, has a new look. At a Model Manglers' (Des Moines, Iowa) contest, Open fliers flew AMA Cubs with this simple variation: model must be the same shape but anything else goes. In the Dallas area, proposed rules are: Must use standard prop and have standard airframe shape and dimensions, but wood sizes and other materials are optional.

More On Torque Meters: To calibrate Paul Crowley's torque meter (p. 38, Jan. 1971 AAM), refer to the sketch and follow these basic steps: (1) Anchor the torque meter firmly and stretch about six ft. of sewing thread straight out from the torque meter hook to another anchor. This thread will prevent the hook from sagging out of line during calibration.

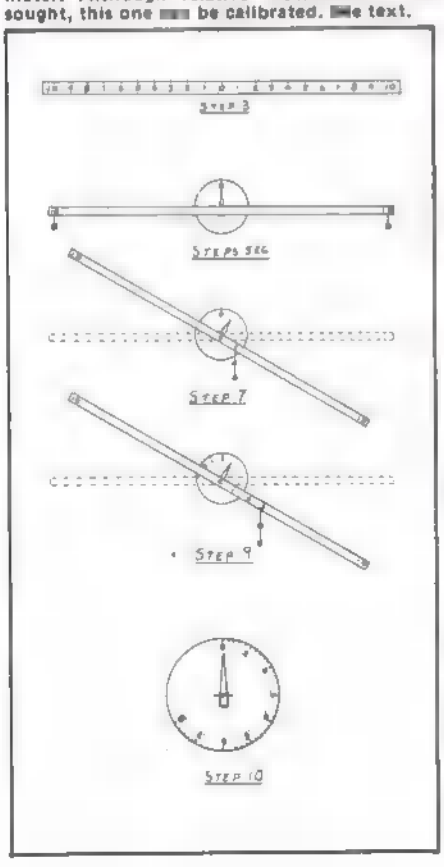
(2) Mark the zero point on the torque meter scale where the pointer naturally rests when nothing is hooked to it except the thread.

(3) Mark a piece of 1/8 x 1/4" balsa in 20 one-in. increments, zero through ten on both sides of center.

(4) Glue this balsa beam to the torque meter hook, exactly centered on the hook.

(5) Hang two equal weights on the beam, one at each 10-in. mark. For indoor models, each weight should be .05 oz.

Another variation on rubber motor torque meter. Although relative measurements are sought, this one can be calibrated. See text.



Lee Liddle shows his winning helicopter in flight at club meet. The whole thing counterspins in flight, getting dizzy.

Hardly needing introduction, a Peanut Fokker by Jerry Farr. These fly well when balanced without excess nose weight.

(6) Balance the beam, with weights in place, so the torque meter again reads zero.

(7) Hang both weights at the right-hand one-inch mark, and rotate the torque meter so the beam is level.

(8) Mark the pointer position as 0.1 in./oz. (a 0.1-oz. weight, 1-in. from center).

(9) Repeat steps 7 and 8 for each one-in. mark on the beam until the entire scale is calibrated.

(10) Divide the spaces between the calibration marks into 5 or 10 equal spaces, giving intermediate calibration points of .02 in./oz. or .01 in./oz., respectively.

Indoor In West Texas: The Key City Proptwisters (Abilene, Tex.) have held indoor contests as part of their club meetings.

BUD TENNY
SPECIALIST CORRESPONDENT

GLIDER AND RUBBER

To Promote The Hobby: The contest season is not yet in high gear, and some logical planning can still be done toward promoting free flight among non-modelers and non-freeflighters. But what? And how can pertinent freeflight experimentation be encouraged? The answer lies in the willingness of each of us to devote some of our free time to the hobby's development and to work with the kids, the newcomers and the curious.

Many in our hobby are well-known for their contributions. Maxwell Bassett, Carl Goldberg, Dick Korda, Chet Lanzo and other pioneers—all of them conjure up a favorite story. Present day proponents include designers and technical developers such as George Xenakis, Bill Gieskieng, and Clarence Mather, as well as those who have devoted themselves to the organizational end, such as Pete Sotich and the late Dick Black, both of whom were instrumental in forming the National Free Flight Society.

How about you? Where do you fit? Do you work with the youngsters to help them enjoy the mysteries of flight? Do you work on developments in model design or organization? If so, good for you. If not, why not?

Robin Crocket, age 11, launches his Jetco Hawk. This is what the future is all about—kids.

The U.S. has no monopoly on experimentation. Many exciting developments taken place in Europe. Germany has advanced the art of construction techniques, such as the S.P.L. Nordic A-2, and Hofsa's torque reaction variable pitch, variable geometry Wakefield. England has been the strong thrust behind rubber model techniques and the almost standard rear-fin design layout. Model development and organizational work know no bounds and anyone who has the desire can join. Why not you?

In future columns, some of the more exciting and innovative of the modeling developments will be described.

Clarity Please: Since "Where The Action Is" began a year ago, dozens of letters have come from modelers all over the continent. Many are loaded with seemingly good ideas and pictures, but the suggestions cannot be deciphered and the pictures are too small, too cluttered, or lack contrast. So, when sending ideas, write and sketch clearly and submit clear black and white pictures, 5 x 7" or larger. Those used in the column will be paid for.

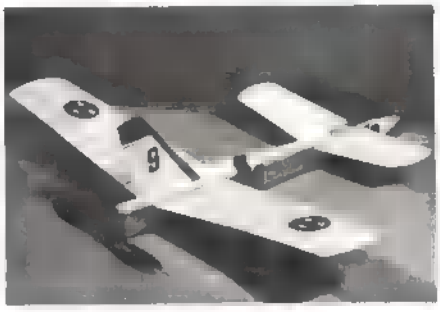
BOB STALICK
SPECIALIST CORRESPONDENT

Tailup

Be the first on your block to fly backwards. Complete plan on back of centerfold.

by Ray Malmstrom

Author demonstrates launching technique. Plane must have adequate airspeed before release, no prop wash over surfaces.



THOSE WHO BUILT the fascinating little Tail First (a canard-type model in the Nov. 1969 AAM) will need no urging to get going on this follow-on model with its easy sheet construction and modern fighter-like appearance.

Trace the fuselage side and transfer it to 1/16" sheet balsa. Cut out two sides, making sure the front elevator and wing slots are lined up accurately. Cut a length of 1/4" and one of 1/16" balsa for the top and bottom of the fuselage and build this assembly (see sketches), adding reinforcing pieces A and B. Carve and sand the fuselage top, and round off the bottom edges to the section shown. Push a length of 1/8" dia. dowel rod through the hole at the front of the fuselage.

Make the nose cone from three pieces of 1/4" sheet and cement it to the front of the fuselage. Fair the nose cone into the fuselage shape with fine grain sandpaper. Then give the fuselage two coats of clear thin dope.

Construct the propeller block from a piece of 1/4" sheet cemented to two thicknesses of 1/16" sheet. Accurately drill a 3/32" dia. hole and insert a short length of 3/32" outside dia. aluminum tubing. Insert the propeller block into the fuselage rear and sand it to shape.

Take a 7" dia. Kaysun plastic prop or a small Sleek Streak prop and sand or file the center flat. Bend a loop in a piece of 18-gauge wire and push the wire shaft through the prop. Since this is a pusher model, the prop must go on with the front of the prop facing the propeller block. Slip two washers and beads on the shaft and insert it through the prop block (see sketch). Then form the hook for the rubber motor with small pliers, and the prop assembly is complete. Give the block two or three coats of dope and put a tiny drop of lubricating oil on the shaft. Check prop for absolutely free revolving.

Cut the fin from 1/16" sheet, noting the grain direction, as well as the small cut near the bottom. The fin fairing piece also is cut from 1/16" sheet. Pin all sheet surfaces down to a board and dope one side at a time. Pinning avoids warps. Give these parts two coats of thin clear dope, lightly sanding between coats. The canopy can be a commercial bubble type or, as we used, the end from a plastic toothbrush container.

The wing is cut from 1/16" sheet (joining is needed with the usual 3" wide sheet). With a knife or razor blade, score, but do not cut through, the centerline on the underside of the wing. Crack along the scored line and tilt the wing panels upward. Run cement into the crack and pin the wing to the building board while the tips rest on the dihedral jigs(x). Wax

(Continued on page 86)

MATERIALS LIST

Medium grade balsa
- sheets 1/16 x 3 x 36"
- strip 1/16 x 1 x 20"
- 1 strip 1/4 x 3 x 20"
- 1 sheet 1/8 x 3 x 4"

6" length 18 gauge wire

3/4" length 3/32" OD aluminum tubing

2 washers

7" dia. plastic propeller, Kaysun or Sleek Streak

1" length of 1/8" dia. dowel rod

Piece of notepaper

Piece of tissue (approx. 5" sq.)

1 tube rubber lubricant

1 tube balsa cement

1 bottle clear dope

Flat rubber strip, 1/8" wide
- 1 52" length
- 1 80" length

Enamel or colored dope

Waterslide decals (squadron numbers)

small bubble canopy

Medium and fine grade sandpaper

Tracing paper

Pencil

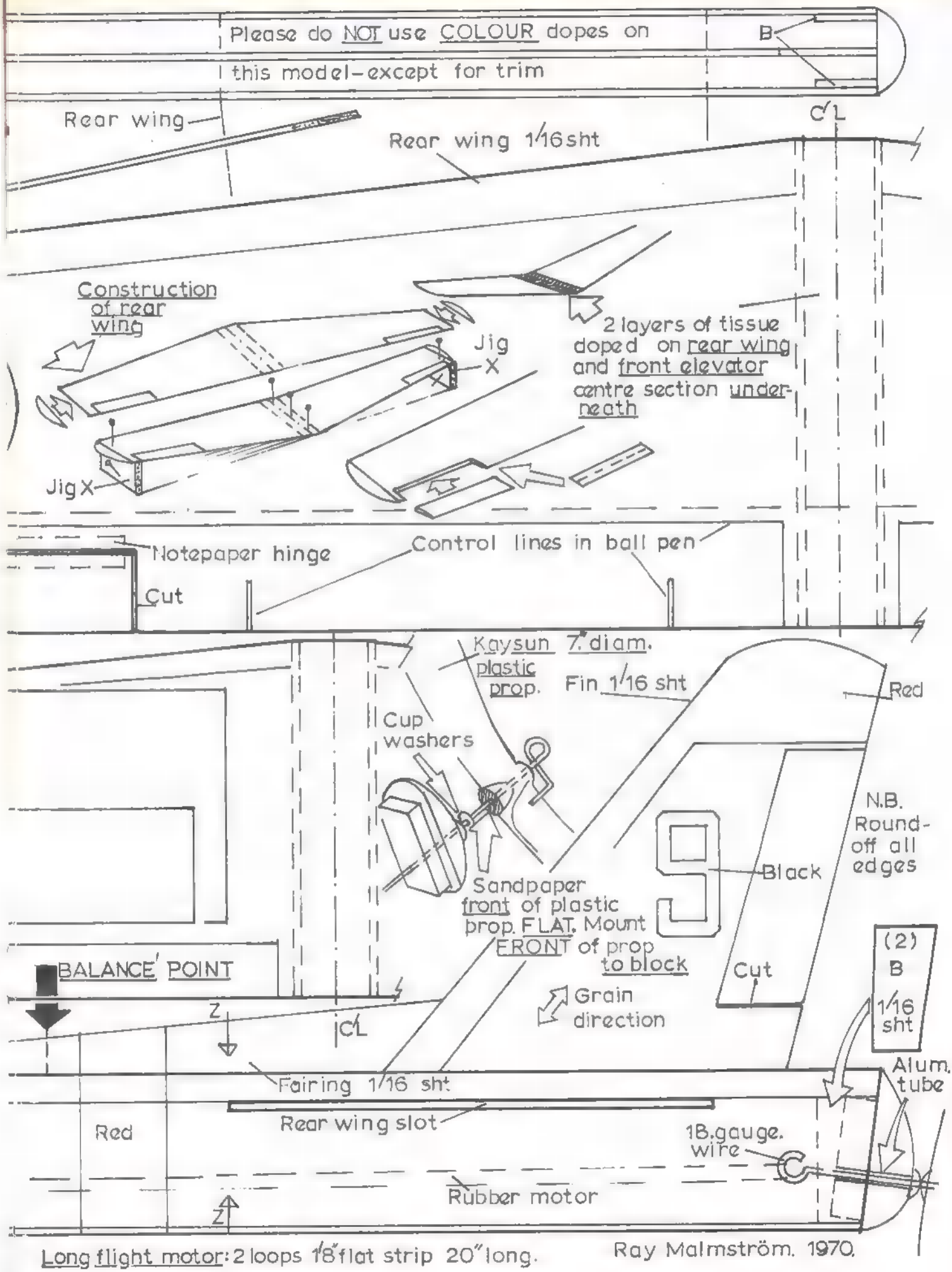
Ruler

Modeling pins

Dope brush

Wire cutters

Long-nose pliers



Long flight motor: 2 loops 1/8" flat strip 20" long.

Ray Malmström. 1970.

"SUPER DELUXE" PILOT ARF'S

There are various degrees of almost-ready-to-fly airplanes. Some are finished to a higher degree of almost ready to fly-ability than others. If you look ■ some of these Pilot airplanes, I am sure you will agree they have added ■ extra dimension into the art of preparing ■ almost-ready-to-fly model. To get ■ real nice job ■ the Cavalier, which is the flagship of the Pilot line, you should spend two evenings. This includes radio and engine installation. The other planes should finish up in ■ evening. Wherever possible, the aileron and rudder are ■ and hinged. The Cavalier and the Shell Fly "B" are superb low wing, high performance, airplanes. The high wing symmetrical section Sky Wagon with its long tail moment is an especially fine acrobatic trainer. The Olympia and the Cessna Cardinal are excellent ■ channel beginner's models. The little Piper Cherokee, being ■ low winger, might frighten some beginners but, with the dihedral that this model has, it is a beautiful and docile 3 channel airplane. We would recommend a 60 ■ engine for the Cavalier, a ■ for the Shell Fly "B" and the Sky Wagon (or maybe a 35), and ■ 15 ■ 19 for the Olympia, Cherokee and Cardinal. Because of the extra effort that has gone into these Pilot kits they are a little more expensive, inch for inch, than many almost ready ■ fly models. For somebody who highly values his time, we think that even at the slightly increased price the extra finish is well worth the effort.

CAVALIER

Wing Span	63.78"
Length	49.60"
Wing Area	635 sq."
Engine	60
R/C Mech.	4 Ch

$69.98

CESSNA CARDINAL

Wing Span	47.24"
Length	35.43"
Wing Area	397 sq."
Engine	15 to 19
R/C Mech	1-3 Ch

$34.98

SHELL FLY B

Wing Span	51.21"
Length	39.4"
Wing Area	460.5 sq."
Engine	30 ■ 40
R/C Mech.	4 Ch

$49.98

CHEROKEE

Wing Span	46.48"
Length	35.23"
Wing Area	387 sq."
Engine	15 to 19
R/C Mech.	1-3 Ch

$34.98

SKYWAGON

Wing Span	52.75"
Length	40.55"
Wing Area	■■■ sq."
Engine	30 to 40
R/C Mech.	3-4 Ch

$49.98

OLYMPIA

Wing Span	46.06"
Length	34.25"
Wing Area	379 sq."
Engine	09 to 19
R/C Mech	1-3 Ch

$34.98

WORLD ENGINES INCORP

8960 Rossash Avenue, 45236

[redacted] ENGINES DIGITAL

BLUE [redacted]

WORLD ENGINES DIGITAL

DESCRIPTION	FACTORY ASSEMBLED	SEMI KIT	FULL KIT
6 Ch. 4 servos	$330.00	$280.00	$245.00
5 Ch. 4 servos	315.00	265.00	235.00
4 Ch. 4 servos	300.00	249.98	224.98
4 Ch Tx w/Power Pak	139.98	114.98	99.98
Add-A-Channel Tx (5-6)	—	—	6.98
6 Ch Decoder + Receiver	60.00	54.00	54.00
5 Ch. Decoder + Receiver	76.00	61.00	51.50
4 Ch. Decoder + Receiver	72.00	58.00	49.00
Add-A-Channel Decoder	—	—	3.98
Rx Pak Charger	7.98	—	5.98
6 Ch. Flite Pak 6 Ser.	210.00	160.[redacted]	141.00
5 Ch. Flite Pak 5 Ser.	205.00	155.[redacted]	138.00
4 Ch. Flite Pak 4 Ser.	199.98	149.[redacted]	134.98
Digit Migit 3 Ch. 3 Ser.	109.98	—	—
Digit Migit 1 Ch.	69.00	—	—
R S-4B Servo	30.00	22.98	18.98
R S-4C Servo	31.00	23.98	19.98
R S-4D Servo	31.00	23.98	19.98

SERVO NOTES

The RS-4C replaces the S-4, S-4A, S-3 servo and works with Controlaire, M.A.N., O.S. Digital Systems. The RS-4B works with World Engines Blue Max Systems, Mule Digital, Digit Migit 3 Ch. and most other 4.8v center tap system decoders. The RS-4D is very similar to the RS-4C but is recommended for systems using SCS Decoders.

Single Stick and 72 MHz

Add $35.00 for 72 MHz and $25.00 for Single Stick Transmitter.

Digit Migit Extra Channel

Digit Migit 1 Channel up elevator or motor control servos at $30.00 each (Assembled only). You can use only one (not both) on the 1 Ch. system.

OS R/C EQUIPMENT

2 Ch. Digital Propo w/2 servos and Rx nickel cadmium + Charger (assem.) $139.98

OS 3 Ch. Digital Propo w/3 servos and Tx and Rx nickel cadmium + Charger (assem.) $199.98

OS 4 Ch. Cougar Digital Propo w/4 servos and Rx nickel cadmium + Charger (assem.) $275.00

SERVICE EXPERTS

The service experts listed in this advertisement are, for the most part, people who have been working with Digitrio and other kit systems in the various areas mentioned. They have all put together an M.A.N. System from a raw kit and have agreed to stock parts that are compatible with World Engines Systems. They have been given schematics of World Engines Systems and current [redacted] Digital Proportional Systems. Many of these service experts service other makes of equipment other than our own. Consider these people for repair work or for help in matching up our flight packs.

WORLD ENGINES R/C
RECOMMENDED SERVICE EXPERTS

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Rfd. 3 West Hill Rd.
Winsted, Conn. 06098
Tel. 203-482-6422

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Radio Electronic Model Shop
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Winchester, Va. 22601
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Complete sales and service Kits and equipment.

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E. W. Bryant R/C
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We service all types of R/C gear—also build radio kits to your spec's.

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Tom Huckaby
1615 Boulderwood Drive
Atlanta, Georgia 30316

KENTUCKY

X-Cell Products
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Lexington, Ky. 40502

SOUTH CAROLINA

S [redacted] Hobby Crafts
794 Piccadilly Drive
Charleston, S.C. 29407
Phone 803-795-1559
or
142 Camelot Drive
Camelot vill.
Hanahan, S.C. 29405
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Charleston's only Digital Propo repair service at reasonable charges.

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Stevensville, Mich. 49127
Try us for FAST service by qualified engineers
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St. Paul, Minn. 55113

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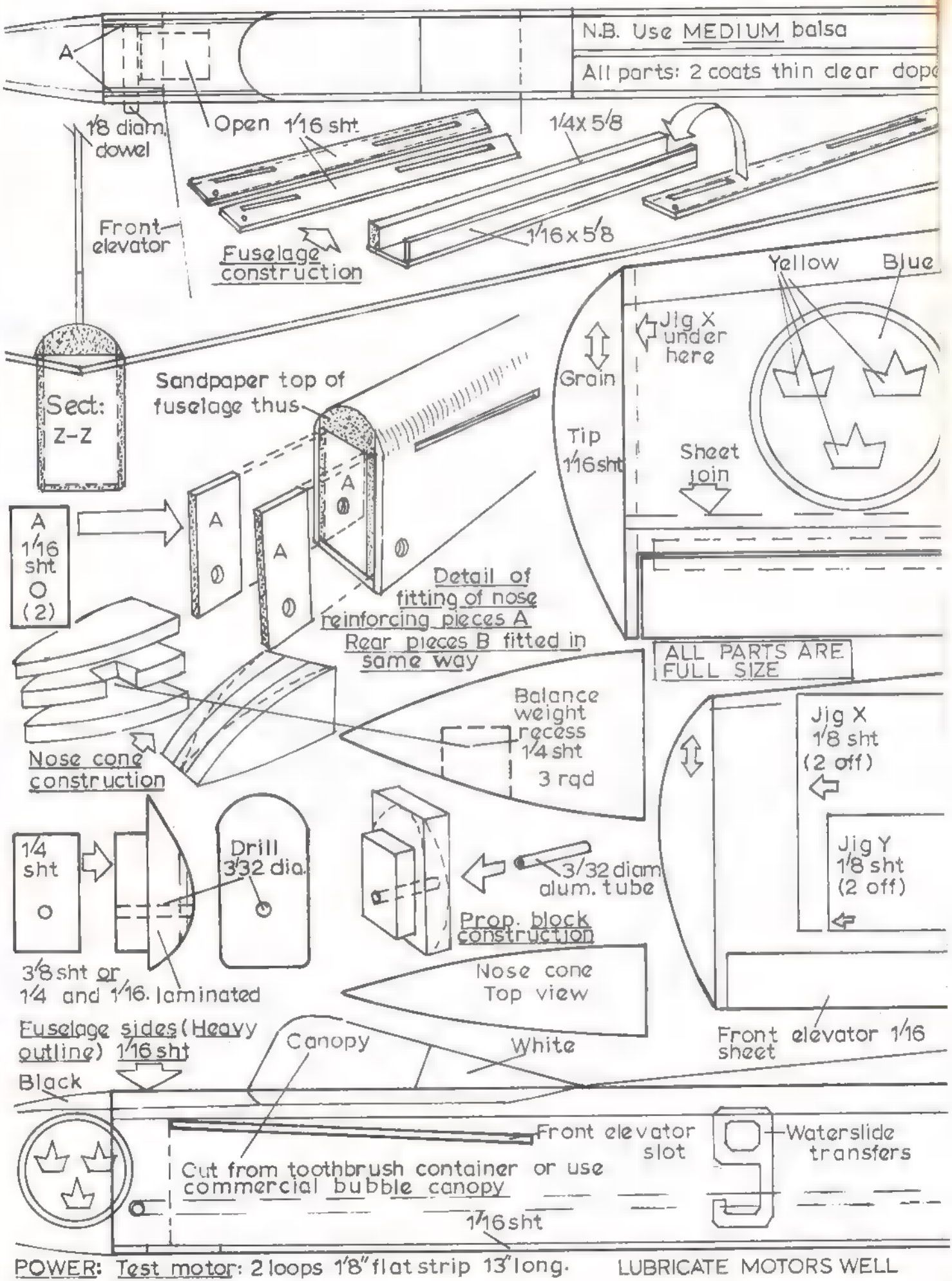
Telephone 513-793-5900


N.B. Use MEDIUM balsa
All parts: 2 coats thin clear dope
A
1/8 diam. dowel
Open 1/16 sht
1/4x5/8
Front elevator
Fuselage construction
1/16x5/8
Yellow
Blue
Jig X under here
Grain
Tip 1/16sht
Sheet join
Sect: Z-Z
Sandpaper top of fuselage thus
A 1/16 sht (2)
Detail of fitting of nose reinforcing pieces A
Rear pieces B fitted in same way
ALL PARTS ARE FULL SIZE
Balance weight recess 1/4 sht 3 rqd
Nose cone construction
Jig X 1/8 sht (2 off)
Jig Y 1/8 sht (2 off)
1/4 sht
Drill 3/32 dia.
3/32 diam alum. tube
Prop. block construction
3/8 sht or 1/4 and 1/16 laminated
Nose cone Top view
Fuselage sides (Heavy outline) 1/16 sht
Canopy
White
Front elevator 1/16 sheet
Black
Front elevator slot
Waterslide transfers
Cut from toothbrush container or use commercial bubble canopy
1/16 sht
POWER: Test motor: 2 loops 1/8" flat strip 13" long.
LUBRICATE MOTORS WELL

THIRTY–NINTH IN A SERIES

getting started in RC

Propellers: selection, balance, and maintenance.

by HOWARD McENTEE

MANY RC FLIERS don't stop to think that the propeller which drives a plane through the air is not only one of its lowest-cost units, but also one of the most important. True, the prop has little to do directly with electronics; however, it does affect flight characteristics and overall plane performance, and it is a vital element in the safety of the flier and those around him.

The correct prop to use is almost always specified when a plane is built from a kit or from magazine plans. Try the recommended size first; if performance isn't as good as expected, then try sizes which vary a bit either way in pitch and diameter. The best prop for any given plane is determined by plane speed and weight, type of flying (violent stunting or gentle sport flying), engine size, even the fuel used. If the kit or magazine plan model comes out to the same weight as its prototype, if it is balanced at the recommended CG point, and if the same engine is used, chances are that the suggested prop will do a good job.

Variations in any of these elements may make another size mandatory. Generally, fast planes use high-pitch props and engine rpm is kept high by changing prop diameter or varying blade area. Other things being equal, a prop with lower blade area will naturally be turned faster. Heavily-loaded planes might not be able to stagger off the ground with a high-pitch prop. Such planes and those with high drag or greater weight need lower-pitch props.

Propeller changes very likely will upset the plane's trim, if it has been trimmed with a prop of different pitch or diameter. Engine downthrust or sidethrust may have to be changed, or the control surfaces shifted a bit, to get straight and level flight with controls in neutral. Trim changes are required when a prop of different size or pitch causes the plane to fly faster or slower or makes a radically different, twisting prop wash pattern around the fuselage and tail surfaces.

Propeller balance is vitally important on any prop-driven plane. Unbalance causes the entire plane to vibrate, and it takes power to shake a plane this way–power that is then not available for moving the plane through the air. Engine vibration can cause control hinges (even husky metal ones) to break and can produce violent vibration which is easily seen in wing and tail surfaces. Imagine what that vibration is doing to the cemented joints!

Some vibration always comes from the engine itself, since it is practically impossible to balance a single-cylinder engine perfectly. Twin-cylinder powerplants, especially those with opposed cylinders, are a vast improvement. So are model Wankel engines. If and when these latter types become available at lower cost, they doubtless will be used by many for their smooth running.

Every propeller should be checked for balance before use. Some will be in perfect balance; many others, sad to say, are far out. This holds true for both wood and nylon types and for all sizes. First check a new prop for a snug fit on the engine shaft. If the prop hole is too small, it can be bored out. If it is too large, suitable bushings can be made from short lengths of hobbyshop brass or aluminum tubing. Do not use a prop which has appreciable sideways slop on the shaft; it can give the same effect as unbalance.

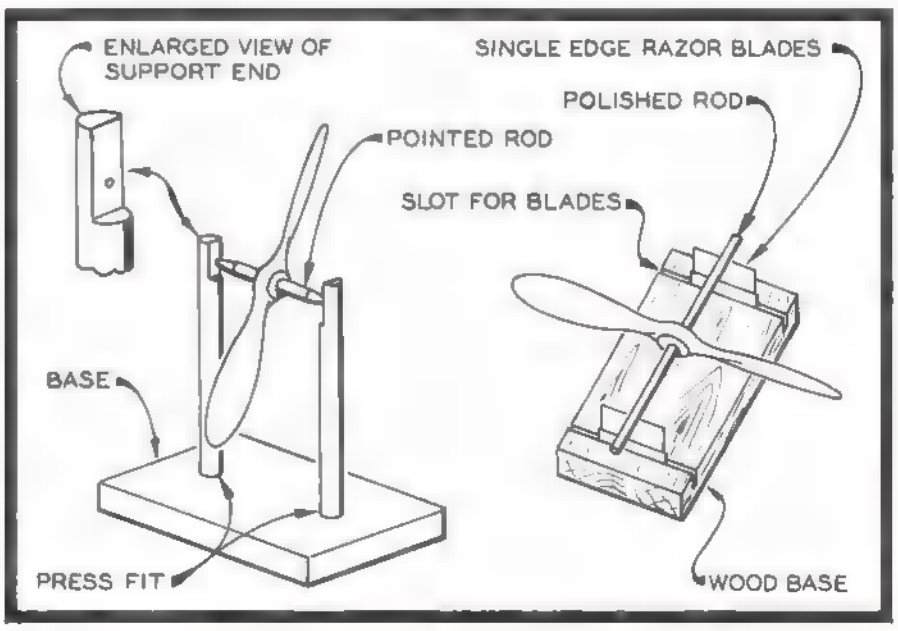
Prop balancers come in many forms and two types are shown here. One is made with brass or aluminum supports, forced into holes in a wooden base. The supports are made of quarter-inch dia. rod. The axle must be a snug fit in the prop hole. Side supports have centerpunch marks in the flattened upper ends to hold the pointed rods. The latter should have slight end clearance. Supports may be sprung apart slightly to set the rod with prop in its bearings. This balancer's great advantage is that it need not be leveled for use. For good balancing, however, the pointed ends must be truly concentric with the rod outside diameter. Lathe-turning is best but, with care and by using files, suitable ends can be turned in a drill press.

The prop blade which drops must be sanded off, a slow job with tough nylon. Wood is much easier to sand. This unit is sensitive enough to balance tiny three-inch dia. props used on Cox 01 engines.

The other balancer is less versatile but easier to make. Two new single-edge razor blades are set in slots in a block of wood, their edges exactly parallel. Before use, this unit must be leveled carefully, or every prop will roll downhill. Sides of the base may be notched deeply to allow more prop swing. Axles must be very smooth, since any bumps on them will give false indications.

Safety is mentioned last, in hopes that these closing words will sink in and be remembered. It goes without saying that modelers try to keep their fingers out of props! But how many always take care to avoid having any part of their bodies come in line edgeways with a running prop? This means head, hands, legs–anything! Turned by today's high-power 60's, numerous props have shattered under the strain. Blades can be thrown hundreds of feet and many modelers have been injured this way, some even losing sight in an eye. The engine usually is started from the front but, as soon as it runs, immediately get behind the prop to tune the needle valve. Also try to keep others from standing in line with the prop.

(Continued on page 88)



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TOTALLY DISCOUNTS MEAN BIG SAVINGS !

Select A Radio That Fullfills Your Needs And Is Right For Your Wallet !

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DIGIT MIDGIT SYSTEM

The DIGIT MIDGIT 3 channel system with one servo is a real solid buy for the beginner who wants to fly rudder only now, but go on to a more sophisticated airplane later. The flight pack is equipped with nickel cadmium batteries. A charger is provided. The transmitter uses a dry-cell battery. There is room on the board in the transmitter and on the decoder for the addition of a fourth channel at a later time and a parts kit to expand from 3 to 4 channels will be offered in kit form by WORLD ENGINES around December 1970

Summer Special $94.88

4 CH.-2 ST. DELUXE

BLUE MAX SYSTEM

THIS IS THE ULTIMATE IN RADIO CONTROL. A FULLY [illegible] DELUXE 4 CHANNEL 2 [illegible]CK SET [illegible] 4 SERVOS, NICADPACKS, CHARGER, [illegible] SERVO [illegible]

12 volt nickel cadmium power supply assures a high power output. Charger with transformer is external. This transmitter is complete with buddy box outlet.

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QUALITY-RELIABILITY

CONTROLAIRE radios this year have been recognized by modelers everywhere as one of the quality radio systems on the market. Many of our customers that have purchased a CONTROLAIRE RADIO, have written us expressing their delight in owning a trouble free radio, and thanked us for the low purchase price. We are particularly proud to be able to offer equipment to our customers, that we know is reliable and at a sensible price. All CONTROLAIRE TRANSMITTERS, from the 'digit midgit' to full house 'Blue Max' are rich black vinyl styled like something you will really enjoy owning. They are the only company that offers a radio system for everyone, that will not only fullfill your needs, but is right for your wallet too!

SEMI-KIT ASSEM. P.C.B.

BLUE MAX SYSTEM

COMPLETE 4CH. 2ST. SEMI-KIT. Transmitter, receiver, nicads, 4 servos and charger. In the semi-kits the Printed Circuit Board is factory assembled, leaving the interwiring to the customer. This gives the factory a chance to pre-test the P.C. Board assembly.

With each full semi-kit system, the factory supplies one completely assembled servo which becomes a time constant comparative device to set up the other [illegible] and stick pots.

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FULL KIT for EXPERTS

BLUE MAX SYSTEM

THIS IS [illegible] KIT 4CH. 2ST. RADIO WITH TRANSMITTER, RECEIVER, NICADS, 4 SERVOS [illegible] CHARGER.

PLEASE NOTE that the parts are not assembled to the board. We would recommend this kit to the more experienced electronic type kit builder.

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THE[illegible] [illegible] GREAT! STRONG–the wings far [illegible] any physical properties of [illegible] any known model aircraft structure. LIGHT–the KAOS wing (644sq.in.) [illegible]ighs only [illegible]. complete with ailerons, hinges and paint. PRECISION MOLDED–custom finished, arrives ready to mount/w hardware.

KAOS – SUN FLI IV – UGLY STICK

PRIMERED READY TO PAINT $49.95 EACH

Order from HOBBY PEOPLE

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extra savings

YOU SAVE 40% ON THIS [illegible]UMMER FUN PACKAGE!

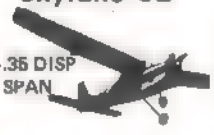
YOUR CHOICE ! MIDWEST NIEUPORT 17 or the FOKKER DVII Foam Wing plane kits, [illegible]t are [illegible]st and easy to assemble. They are great flyers, either for single channel or small multi-proportional sets. 44" span. [illegible] [illegible] just for the FUN-OF-IT! Reg. $19.95

Plus you [illegible] [illegible] O.S. 15R/C Engine Reg. $16.95 to top th[illegible] summer package special !

REG.$36.96 VALUE

Summer Bonanza $21.[illegible]6

GOLDBERG Skylane 62



.19–.35 DISP 62" SPAN

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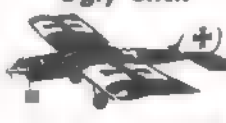

[illegible]0" SPAN .45–.61 DISP.

Reg. $39.95

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DuBRO Cherokee Arrow

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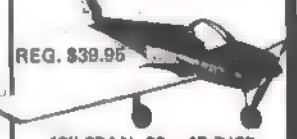

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GREAT FLYING PLANES [illegible] RUDDER ONLY WITH RADIOS LIKE THE 'DIGIT MIDGET' OR 'TESTORS' UNIT. ALL PLANES [illegible] [illegible] MOLDED [illegible] [illegible] (44" Span) AND STAB, AND WILL FLY WITH A .04[illegible]

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R/C 1/18 scale CORVETTE STING RAY

[illegible]

GOLDBERG CH-2 Short Control Horns

REGULARLY 50¢ A PAIR

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4 pair/ 99¢

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DELUXE SPRAY GUN SET INCLUDED: V-belt driven piston type (110 volt) air compressor, 12" air hose, No. 16 siphon type spray gun complete with material jar, open and fine spray nozzles, and No.AB-100 shading brush kit complete with material jar.

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extra savings

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MAKES A NICE GIFT ! Only $2.[illegible]

When Buying TIE TAC Jewelry, Insist On ELECTROCONE!

MIDWEST

[illegible] BONANZA

Das Little Stick

46" SPAN .19–.23 DISP.

Regularly $22.95

$15.87

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LIL 'T' GLIDER Reg. $18.95	$11.91
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Contender

54" SPAN .29-.60 DISP. REGULARLY [illegible]

SUMMER BONANZA $24.99

R/C NOBELER 51" SPAN .35–.45 [illegible]P. Reg. $30.00	$19.99
R/C HEADMASTER 45" SPAN .09–.35 DISP. Reg. $14.95	$11.99
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U/C COMBAT CATS 2 in 1 .19–.35 Reg. $7.95	$ 5.97

We Met The Challenge

THE CHALLENGE to have a high quality 4 Channel Digital Radio Set, that could be priced low enough for a beginner [illegible] get started in R/C !

THE [illegible] the PHOENIX by HOBBY PEOPLE. Our new PHOENIX is a low priced radio for those who [illegible] to have full use of a full [illegible] CH radio. The purchase of a PHOENIX means that, you can start flying rudder and elevator or throttle and rudder immediatly. When ready, the purchase of two more [illegible] will give you a complete 4 [illegible]H. [illegible]

If you plan [illegible] use the PHOENIX [illegible] a [illegible] or boat, unlike 2CH.sets, you may expand into other channels without having to purchase [illegible] [illegible]lo.

4CH. TRANSMITTER-RECEIVER AND [illegible] SERVOS

[illegible] CHANNEL transmitter factory assembled with 2 STICKS. The transmitter [illegible] [illegible] dry 9V. battery, good for [illegible] full season, [illegible] omits the meter. 27mhz only.

Lightweight FLITE PAK featuring a 4CH. receiver. 2 RS-4 mini-servos, nickle cadmium batteries and charger, switch harness and servo trays.

YOU GET *RADIO * ENGINE * PLANE FANTASTIC $159.99

BIGGEST SAVINGS EVER OFFERED TO R/C BEGGINERS!

THE RADIO Our new PHOENIX is an assembled 4CH. 2ST. system, featuring a 4CH. receiver, 2 complete servos, nickle cadmium airbourne power pack and charger. The transmitter is dry without [illegible] meter. With the addition of two more servos, you will have a complete 4CH. system. THE PLANE The MIDWEST TRISQUIRE [illegible] selected because [illegible] feel it to be [illegible] most stable flyer and ideal multi-trainer. It may [illegible] flown either with motor control and rudder, or elevator and rudder. THE [illegible]E Choose One

O.S. .15R/C
FOX .15R/C
COX MEDALLION .15

FOR THE GLIDER FANS If you would rather fly a glider, we offer the [illegible] CANYON SCHWEIZER however no engine may [illegible] selected.

ELECTROCONE GLOW PLUG

R/C [illegible] FOR NORMAL FLYING CONDITIONS

R/C COLD FOR TEMPERATURES OVER 90°

"When Performance Counts!"

HOT OR COLD

$1.29 EACH

STANDARD LONG AND STANDARD SHORT TYPE

BALSAWOOD BONANZA

DEMENSIONS [illegible] 36"	PIECES PER BUNDLE		REGULARLY	SUMMER BONANZA
1/16 [illegible]2	20		$ 8.00	$3.[illegible]6
1/16 X3	20		$ 7.00	$4.74
1/16 [illegible]	20	BUY	$10.00	$6.99
1/16 [illegible]	10	MIDWEST	$11.00	$7.76
3/32X2	20	AND	$ 7.00	$4.74
3/32X3	20	GET THE	$ 9.00	$6.99
3/32X4	18	BEST	$ 9.25	$6.77
3/16X2	10		$ 5.00	$3.48
3/16X3	10		$ 8.00	$3.98
3/16X4	10		$ 8.00	$5.57
1/4X3	10		$ 8.00	$5.57
1/4X4	10		$ 9.00	$6.99

U/C SUMMER SPECIAL

YOUR CHOICE MIDWEST

Profile 48" [illegible]

P-51 P-63 ME-109

Regularly $10.95

FOX [illegible] Stunt

Regularly $16.95

$28.00 VALUE **SALE $17.76**

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NEW MIDWEST **Super Sniffer 300**

Regularly $8.95

[illegible]" SPAN

COX .049 **Babe Bee**

Regularly [illegible]

$14.93 VALUE **SALE $9.99**

TESTORS R/C Skyhawk Set

REG. $100.00 !

R/C TESTORS RADIO CONTROLLED PLANE Features 6 transistors transmitter, superhet receiver, nicad airbourne pack, and true pulse control actuator.

[illegible] PLANE...READY TO FLY...OUT OF BOX

SUMMER BONANZA **$64.76**

Plane Only

TESTORS PLANE (ONLY) [illegible] ready to fly 44" span–high impact styr[illegible]

Regularly $20.00 *SALE* $14.97

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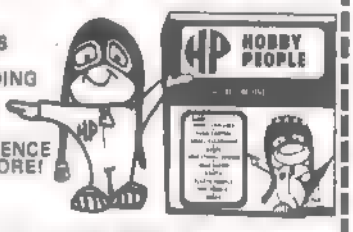

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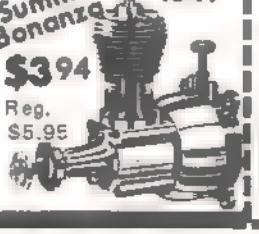

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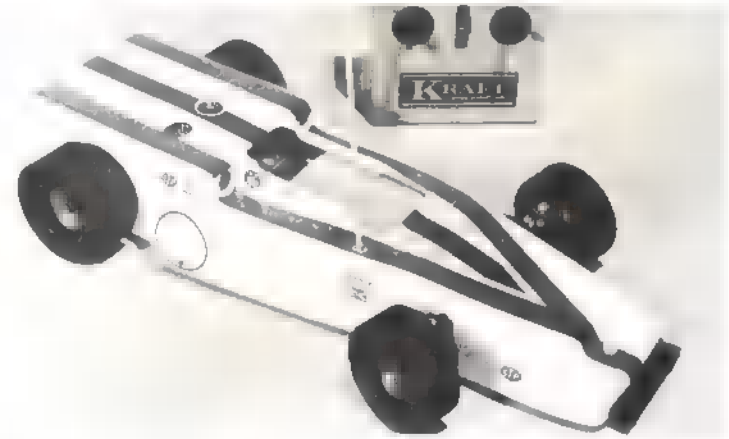
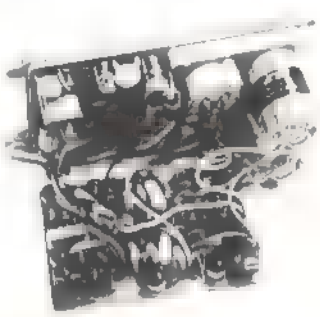
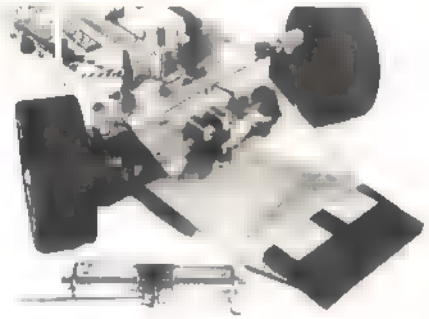
Kraft 2-Channel Brick In The Curtis Car

by FRED MARKS and WENDEL GREEN



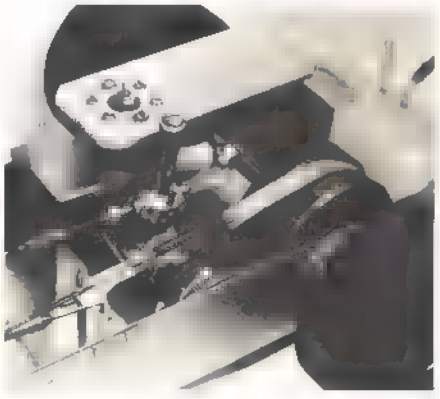




Their basic simplicity makes the Kraft units economical. Dry battery should last a full racing season. Sticks can be repositioned.

Familiar Kraft receiver operates decoder/servo amplifier board. Servos are essentially KP-12 with small motor. Neat and compact.

Spring steering system supplied works only with C-S servo. We adapted the brick with torsion spring setup as illustrated.



Unique and outstanding clutch/brake unit is located on the axle. Composition sponge tires give excellent road holding.

THE CURTIS CAR is unique in many respects, not the least of which is its competition potential. Unlike other production radio-controlled cars, the Curtis has a belt drive with the clutch brake mounted on the axle rather than on the engine shaft and there is no front suspension as such.

The car's chassis is a deep steel channel, which provides a generous space for radio gear. Since the chassis is not rigid, the resulting torsional deflection contributes to the tenacious handling characteristics of the car. A formed plate covers the radio compartment and keeps most of the dirt and grime out. The only way the radio can be gummed up is by spilled fuel running forward in the chassis under the radio compartment lid. A little care and an overboard vent will prevent this.

The belt-drive engine mounting leaves the exhaust pointed forward, creating a problem of getting the exhaust out of the car. Curtis solves this problem nicely with a built-in manifold, which provides a free exhaust exitting through the bottom of the chassis. To install the Webra 20 in our car, the manifold had to be enlarged to handle the slighly wider exhaust of this engine. A discussion with the people at Curtis indicated that the manifold in subsequent production cars will be modified to fit all of the engines legal under the ROAR 1971 rules.

Our experience with Curtis is that they do listen to car owners and then take action to improve the car. As a case in point, when we first drove this car it turned right (or sometimes left) when the engine got up to full power and also when the brakes were applied. This resulted in a most exciting driving session. It was determined that under high torque conditions, the wheels were slipping on the axle. A call to Curtis resulted in a prompt replacement of the rear axle and wheels. The new axle and wheels solved our problem. The company also checked all succeeding production cars for this problem. (Incidentally, a paper shim will fix any slippage situation.)

The front end has built-in Ackerman and the caster and camber adjustment are easy. If instructions are followed, the front end stays put. Toe-in adjustment must be done carefully or the centerline to wheel distance will be different on each side, resulting in a car that won't track true.

During the testing period, the clutch worked smoothly and appeared to be reliable. The brake will stop this car from full steam right now. This impressive brake, when properly adjusted, allows going so deep into the corner that it takes quite a little getting used to. The brake is so effective that great

(Continued on page 74)

Modeler Mail

(continued from page 10)

RC help

I have been a model and aircraft enthusiast for the better part of my life and was introduced to your magazine about three years ago by a friend. I took an immediate interest in AAM and started buying it each month.

There is particular field of modeling you have helped me with greatly: RC. Before encountering your publication, I had no idea what RC was and how it functioned. Now I am fairly knowledgeable on the subject. You also have helped me in selecting equipment, especially with your monthly explanation of different brands, their cost, general performance, and brand variables.

With this help, I am now seriously considering the purchase of an RC pulse proportional set and will probably put it in a Dick's Dream with an 020.

Thomas Bell, Brookline, Mass.

Cleveland collector

I am from the older generation of modelers who grew up a la Junior Birdman. . .Bill Barnes. . .G-8. . .et cetera, and have enjoyed my silent part in it. I feel modeling has a long way and will go on to greater and better things. RC will be within the reach of more of us and presents a great building challenge to the scale fan.

I'm leaning to the Cleveland type of kits and have been trying to secure a few of them

to build. I remember wishing I had the money to buy those precision kits during the 1930's; now that I can afford them, I can't find them. However, I have acquired a few from collectors at collectors' prices.

Perhaps a reader can assist me in finding the SF 100 B17 by Cleveland—that's one I want to build. Also enclosed are photos of Cleveland's Mr. Mulligan.

Steve Kanyusik, 930 Spruce Dr., St. Cloud, Minn.

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MAY 1971

MODEL AVIATION

Official magazine

A.M.A. NEWS

Academy of Model Aeronautics ■ 806 Fifteenth Street N.W., Washington, DC 20005

100,000 Kits in AMA-HIAA Delta Dart Program

The most enterprising activity ever devised to interest youngsters in model airplanes has been taking place all throughout the country since last fall. It's the AMA-HIAA Delta Dart Program utilizing that magnificently simple and flyable rubber-powered model designed by AMA Technical Director **Frank Ehling**. Having had several variations and names (AMA Cub, AMA Racer, etc.), this most simplified version of the Delta Dart is aptly called the HIaa FLYer.

What makes this joint effort of the **Academy of Model Aeronautics** and the **Model Aeronautics Division** of the **Hobby Industry Association of America** so great in scope is that it involves kits for 100,000 models, plus contest prizes, advertising posters and publicity hints for up to 1,000 contests. The kits, prizes and materials are free of charge to AMA chartered clubs, except for a token sanction fee payment which includes liability insurance—the clubs are obligated only to host a building session with ■ follow-up contest. Just imagine the growth potential of model airplane activities ■■■ if the interest to continue is whetted in only ■ small percentage of those who build and fly the HIaa FLYer.

But the road to successful fruition of this program wasn't entirely smooth. First the instructions for building and flying the model had to be revised. Those used previously had too much fine print for the target group of youngsters, age 8 to 13. Fortunately AMA Public Relations Director **Bob Lopshire**, well known author and illustrator of children's books, was able ■■ do the job, and he converted the fine print to a series of simple, meaningful illustrations. The basic model wasn't changed, but the new instructions made much simpler the construction by a novice, taking him graphically from one step to the next.

And the Model Aeronautics Division of HIAA, co-chaired by **Frank Garcher** and **Mike Schlesinger**, had ■ lot of coordinating to do. The entire kit production, packaging and shipping effort was financed by division members, with those

Frank Garcher, above left, shows the features of the Delta Dart model to YMCA Director Dave Lee. Garcher and Mike Schlesinger, co-chairmen of the HIAA Model Aeronautics Division, organized the industry effort to produce 100,000 HIaa FLYers. Photos below are from a New York City pilot program at Junior High School 198. The fruit of the day's activity is shown at left, while at right Howard Kelem, the school's Aerodynamics instructor making ■ point, and students assembling HIaa FLYers are observed by Marty Namm, HIAA P.R. Manager, Harry Krane, Supervisor, N.Y.C. Board of Education, and Walt Schrader, publisher of Model Airplane News. The pilot program, publicized in the N.Y. Daily News, was hailed as an unqualified success.

Left photo shows Vice Admiral Bernard M. Strean, Chief of Naval Air Training in Pensacola, Fla., chatting with Delta Dart Meet participants. Admiral Strean frequently honors the National Model Airplane Championships with his presence. In her classroom at Ft. Meyer Elementary School, Arlington, Va., Miss Peggy Stephenson with three pupils in right photo. She took part in another pilot program, this one organized by the National Aerospace Education Council in conjunction with HIAA and AMA. The Delta Dart is being tested for use as the basis of a system for instruction in basic mathematics, geometry, algebra, physics and aerodynamics.

Fifty youngsters competed in the Delta Dart building/contest program at the Massillon, Ohio, Boys' Club. It was a great success, reported John Smith, even though only two of the entrants had ever before built a "stick model." Members of the RC Alliance Balsa Bees and the CL Nitros, from Canton, provided the instructors. "The instructors had as much fun as the contestants," he said. Winners 8-9 years at right. Bulk packs include awards for three age groups.

The photos above and below were taken during a Delta Dart building session and contest put on at the Virginia State School for Handicapped Children—organized jointly by the FF Brainbusters Club, Southeastern Virginia RC Group and the Hampton Hobby House. Instructors shown are Gene Hartmangruber (above) and Hewitt Phillips (below). A most rewarding seven hour period was spent with the kids.

in the balsa kit-making and printing businesses doing various parts of the work instead of a cash contribution. This meant that the pieces from all parts of the country had to be gathered together for assembly into bulk-packs of 100 kits and the appropriate number of related pieces. Assembly, alone, was a formidable task.

There were some problems, but fortunately they can be classed as annoyances rather than setbacks. For instance, early announcements of the program to AMA chartered clubs through their Monthly Mailing were predicated upon the bulk-packs being ready for distribution by mid 1970. A number of AMA clubs proceeded on this basis, setting up local programs with Boy Scouts, schools, etc., and then had to reschedule when the necessary shipping date couldn't be met because of a trucker's strike and other reasons—an aggravation but not a catastrophe. Then there was the matter of the prizes. AMA member **Phil Edwards** had tooled a prototype of a silver-dollar-size bas-relief medal featuring the HIaa FLYer in flight along with the AMA wings. These attractive medals were to be fastened to ribbons for the first through third place winners at each local contest, but a trial production run proved that costs were too high to continue. A few of the medals were included in early bulk-packs; any youngster lucky enough to have received one as a prize should treasure it as a collector's item.

Trial Run at Nats

The 1970 National Model Airplane Championships at Glenview (Ill.) Naval Air Station proved out the feasibility of bulk-packaging the HIaa FLYer kits as opposed to the previous, more costly, individual kits. There, during five days, more than 2,000 youngsters constructed and flew HIaa FLYers under the direction of AMA Junior Program Chairman **Ed Abram** and his crew of volunteer instructors.

How Program Began

The current operation is an outgrowth of the 1969 AMA-HIAA-Navy Regional Meet Junior Program which featured four events: Delta Dart rubber model, HL Glider and two special Control Line Events. Major winners were sponsored to the Nats. That program served a very definite purpose, but it also had its limitations. Being tied to the Nats, it was curtailed to only a few months of the year. The prizes were costly, being medals plus model merchandise and Nats trips, restricting the total effort to just 20 meets. But the biggest limitation was that the program was attracting primarily youngsters who were already engaged in modeling. This was so even with the Delta Dart event because the entrant had to learn about the program through such sources as hobby shops and this magazine, then he had to obtain the kit and build it on his own.

The current AMA-HIAA Delta Dart Program is not tied to any particular time period. It can be organized in the spring, summer, fall or winter whenever the program best fits in with local conditions—and it doesn't have to be this year; it could just as beneficially be held next year (if the supply of kits holds out). Building should be indoors, but flight can be either indoors or outdoors. Expense for contest prizes is not required—prizes are provided to host AMA clubs together with the bulk-pack kits; in fact, the model given to each youngster is a prize in itself, free to each one who enters. Local programs in many more areas are now entirely feasible. The current program involves both constructing the model and flying it under supervision, an essential ingredient even for such a simple airplane as the HIaa FLYer; it is vital that a youngster's first attempt to build and fly a model be successful.

Fifty-two local programs have already been held or scheduled, some involving several hundred entrants. In a few instances AMA clubs have organized more than one building session-contest with different groups in their area.

How to Get Involved

The AMA-HIAA Delta Dart Program is operated through the AMA chartered club system. All the club needs to do is send in the Application for Delta Dart Sanction (previously distributed to chartered clubs), indicating the number of contestants the club will be prepared to host plus various other information. The only charge is a sanction fee of $5 per hundred contestants, including liability insurance for each participating youngster. Kits, prize ribbons and certificates to tenth in three age groups, posters, publicity information, insurance, etc., are provided for the token sanction fee.

Delta Dart sanction applications must be sent to AMA HQ at least 45 days in advance of the planned meet date. If your club's Delta Dart sanction application has been misplaced, write for another. If you club is not in AMA's roster of more than 600 chartered clubs, write for free club charter information—**AMA HQ**, 806 Fifteenth St., N.W., Washington, D.C. 20005.

Record Reviews

A report of selected recent record holders highlighting the designs and equipment used.

FF FAI Power national AMA record, Senior age class: 14 minutes, 57 seconds, established by Terry Davis, E. Chattanooga, Tenn., on August 16, 1970.

Terry's design came from the August 1960 **Aeromodeller**, the "Pulteri" by Osmo Niemi. Its wing is 60¼" by 8", and its stabilizer is 26¼" ■ 5¼". Only the wing tips have dihedral. The model's #3 light weight Esaki silk covering was finished with Sig dope. Power came from ■ Cox Mk II. .15 and Kavan 8"D x 4"P fiberglass prop. Davis used ■ Tatone Flood-Off, Tatone DT (plus Sig fuse backup) and a #6 Perfect fuel tank.

CL ½A Proto Speed national AMA record, Junior ■■ class: 91.32 mph, ■■ tablished by James Wade, Anaheim, Calif., ■■ August 15, 1970.

Wade's model was an original design of 20¼" wingspan. Its stabilizer was of 7" span with V-dihedral. The wing airfoil changes from lifting at the center to symetrical at the tips, while the stab airfoil is symmetrical throughout. The wing and stab were covered with Mono-Kote, while the fuselage bottom was formed of fiberglass by Dale Kirn; the top was ■ full Cox speed pan. The fuselage was finished with Poly-Aqua epoxy. The model, with K & B streamline wheels, weighed 7 ounces.

Power came from a Cox TD .049 with high-compression head, left-hand crankshaft, Dale Kirn fiberglass prop of 4¾"D x 5"P, home brew 62% nitro fuel and pen bladder pressure tank. Single line control was provided by ■ Stanzel handle and ½A ■■ & R torque unit. Wade followed the prevalant custom of taking off with his hand already in the pylon to achieve a faster first lap clocking.

Wade increased this record to 95.60 mph ■■ October 18.

Indoor HL Stick national AMA record, ceiling category I, Open age class: 21 minutes, 6.2 seconds, estabilshed by Robert Platt, Jr., Yorktown, Va., on April 25, 1970.

Platt's original design has an off-center mounted wing with span of 25.1", center chord of 8", elliptical dihedral, 5½% camber circular airfoil. The stab is 16" by 5.4", 3½% camber circular airfoil; and the vertical fin has ■ height of 4.5", 2.5" chord. The motor stick length is 14.5", and the tail boom, to the trailing edge of the stab, is 11". The propeller is of 18" diameter, 30" pitch, powered by ■ 14¼" loop of .074" Pirelli lubed with green soap and glycerine. The weight of the model, covered with Micro-X microfilm, was .083 oz. with rubber.

On another flight with this model ■■ the ■■■ date, Platt also established the

President's Memo

The Academy of Model Aeronautics is ■ fantastic organization. It is made up of thousands of classes, ages, rules, regulations, licenses, magazines, clubs, insurance, personalities, gripes, benefits, displacements, frequencies, line-sizes, wing areas, scale details, sponsorships, FAI, championships, and 32,000 individuals. And it all has to work as one machine for the benefit of each one, individually and collectively, and for the community.

All of this, mind you, is handled by a very small but very dedicated salaried Headquarters staff and hundreds of fine public spirited and highly qualified volunteer help. These people, in the midst of ■ fun activity, must be able to think soberly and thoughtfully, being ever mindful of safety and the public interest as well as protecting our own selfish interests.

It is pretty wonderful to see an organization where so many people go well beyond their obligation to serve. I have had this indelibly called to my attention by the flood of concerned member mail received personally be me since my election.

Also, it takes a lot of thought and careful action just to be ■ good AMA member. I am going to elaborate on this in a future article.

You would have to be in ■ position such ■■ my present one to understand the profound complexities involved in running ■■ association which is expanding ■■ fast ■■ ours is. I am ■■■ that sometimes your pet phase of AMA's activities seems to be neglected, misplaced, misdirected or forgotten. But at the same time thousands of things are being done, and the growth of AMA is proof that we must be doing an awful lot of things correctly. Sometimes just to be ■ good member requires a lot of patience. We appreciate your constructive criticism, especially if you offer us solutions to consider. And please believe that you'll get far quicker attention if you "Smile when you say that, pardner!"

AMA President John Clemens

Of course if you have paid your dues and voted, it is always your privilege to just gripe, if you are that type of person. But for the trouble you cause when you gripe, I suggest you compensate by sending in a little donation at the same time.

There is something you can do to get more out of AMA for yourself: belong to ■ chartered club. Every month ■ "latest poop" bulletin is mailed to all chartered AMA clubs, the model press and all elected and appointed officers of AMA. Copies of the bulletin are sent to two different officers in each chartered club. If you never hear about these bulletins or their contents, find out why from your club officers. The information you are missing may be just the word you've been waiting for. Check to ■■ if AMA HQ has a list of your current officers. When I was in Washington in January I snooped through the chartered club files, and I ■■ astonished at how many clubs had submitted no updated information. Be a good member and check on yours. If your club isn't yet chartered, shame, shame! Ask AMA HQ for ■ charter application kit, and join the more than 600 clubs whose members ■■ already enjoying extra benefits, protection and information.

John E. Clemens
AMA President

FAI Stick national AMA record for FAI ceiling category I with ■ performance of 20 minutes, 37 seconds. The flights were in the Willis School auditorium, Hampton, Va., used extensively for low-ceiling record trails.

FF HL Glider national AMA record, Open ■ge class: 10 minutes, ■ seconds, established by Richard Mathis, Richardson, Tex., on May 31, 1970.

This design by Mathis is basically the same ■ his "Flash" glider which appeared in the July 1970 **Flying Models**. According to the designer, it currently is kitted by M & P Enterprises. Compared with the published version, the record setting model's spruce fuselage was lengthened to 21", and the stabilizer is ■ little bigger at 8" span. But it retains the tapered-from-rear polyhedral wing tips and the tapered-from-front anhedral stabilizer. The record setter (actually two identical models were used, both lost out-of-sight despite dethermalizers on each) used the "Banzai" airfoil which has the leading edge raised 3/32" in relation to the maximum ¼" wing thickness. Wing center chord is 4", and the 1/16" sheet stab has a 3" center chord. Finished with 6 coats of lacquer, the model weighed 1.7 ounces. The flight pattern is right climb, left glide.

Indoor Helicopter national AMA record, ceiling category II, Open ■■ class: ■ minutes, 1 second, established by Thomas Vallee, Laurel, Md., on August 30, 1970.

The model is ■ modification by Vallee of ■ helicopter designed by Bill Bigge which appeared in the **1959-61 Zalc Yearbook**. Its two built-up rotors of 14.5" diameter compare with an earlier model having 12" rotors that Vallee flew for a ceiling category I record, at a weight increase of only .003 oz. The current model also has ■ lesser power requirement, using ■ 10" loop of .040" Pirelli lubed with glycerine and green soap. Model's total weight is .016 oz.

The model's 11" motor stick was constructed from Micro-Dyne .012" sheet balsa. It used a Micro-X prefab rotor bearing, and the rotors were covered with Micro-X Red Label microfilm.

FF A Gas national AMA record, Senior age class: 35 minutes, 10 seconds, established by Raymond Faulkner, Claremont, Calif., on September 27, 1970.

The model ■■ a Kyosho Corporation "Galaxie 585" kit powered by a Supertigre 19 fitted with a Fire Ball (cool) plug and Tornado prop of 8" pitch, 4" diameter. Fuel in the Perfect #6 tank was Ray's own mix of 40% nitromethane, 35% methanol and 25% castor oil. The model weighed 17 ounces.

The Galaxie's wing ■ 70" span by 8½" chord; the stab is 29" by 6½". The model was covered with Sig Jap tissue and finished with Aero Gloss dope. A Tatone Tick-Off timer was used for engine run—Sig fuse for actuating the dethermalizer.

FF Coupe D'Hiver national AMA record, Senior ag■ class: 9 minutes, 6 seconds, established by Paul Ryan, Anaheim, Calif., ■■ November 8, 1970.

The wing of Paul's original design model has a rectangular planform with 4¾" chord and 42" span, multi-spar construction, NACA 6409 airfoil. The stab is also multispar and rectangular, with dimensions of 3½" by 15", 9% flat bottom airfoil. The wing is mounted on a 2 7/16" pylon of 1" thickness, same as the fuselage at that point. Overall fuselage length is 37¾".

The model is powered by six 10½" strands of ¼" rubber, lubed with a mixture of glycerine and boiled green soap, swinging ■ prop of 15½" diameter by 17" pitch. The record setting design was built from Sig contest balsa, covered with Sig Jap tissue and finished with nitrate dope. The dethermalizer is ■ pop-up stab actuated by Sig fuse. Flying weight was 80 grams.

CL Jet Speed national AMA record, Open age class: 184.62 mph, established by Myrle G. Hoyt, Newton, Iowa, on August 16, 1970.

Hoyt's model is the "Sidewinder" which he kits. Power for the 32-ounce model comes from ■ Dyna-Jet tail pipe with OS engine head having ■ polished interior ■■d .070" modified valve retainer. As seen from the photograph, the engine is mounted to the side of the fuselage, outside the flight circle; and the stabilizer, mounted with 2° positive incidence, is solely to the inside. The wing's major dimensions ■■ 22" by

2¾", and the stabilizer has a 6" span, 3¾" center chord. Airfoils of both ■■ symmetrical.

Single line control ■■ accomplished by Hoyt's own torque unit in the model and a geared handle by George Aldrich. The model was constructed primarily of bass wood (wing and fuselage), the stab from ⅛" Sig 5-ply birch. In order to fit within the slender fuselage, the metal fuel tank is extremely long, dimensions being ¾" ■ 1¼" x 11". The model ■ finished with Martin Senour engine paint (Chevrolet orange) which provides excellent flight visibility.

■■ C Gas Rise-Off-Water national AMA record, Senior age class: 3 minutes, 1 second, established by Raymond Faulkner, Claremont, Calif., on November 1, 1970.

Floats were fitted to this "Spacer," kitted by Competition Models, enabling it to establish the seaplane record. Powered by ■ McCoy 40, the 30-ounce model has a 66" span wing, 9½" chord; 23" span stab, 7" chord. The engine used a Fire Ball (cool) plug, Tornado 10"D x 4"P prop, Perfect #6 tank, home mix fuel of 40% nitromethane, 35% methanol, 25% castor oil.

The model was covered with Sig Jap tissue, finished with Aero Gloss dope. Tatone timers were used both for engine cut-off and dethermalizing.

General Record Information. The flight records reviewed here were all established during 1970. Many do not carry forward to 1971 because of revised AMA age classes or revised competition rules. The current AMA age classes: Junior members are those who are under 15 years of age; Senior members are those 15 but under 19; Open members are 19 or more years of age. For classification purposes, ages are taken as of July 1 each year.

U.S. Scale Team Selection Program

Some details are still to be decided, but the U.S. teams for the 1972 Scale World Championships will be picked at the 1971 National Model Airplane Championships. Six AMA members—three for Radio Control and three for Control Line—will be chosen from among Nats contestants in the Scale events who pre-register in the Team Selection Program and who enter models in the RC Scale or CL Scale events.

Note that models meeting either AMA or FAI Scale rules may be entered in the Nats, and those complying with either rules will be considered for team selection. It was not determined when this was written whether the Nats events would be flown and judged in accordance with AMA or FAI rules—this decision was expected to be made at the Nats Planning Conference in late February.

Scale Team Selection Program Registration may be made in either of two ways:

1. **In advance by mail,** postmarked not later than June 30—send advance program entry fee of $5.00 (check or money order payable to AMA, indicating either RC or CL) to AMA HQ, 806 Fifteenth St., N.W., Washington, D.C. 20005.

2. **At the Nats,** during registration and prior to flying—late program entry fee of $10.00.

These fees go directly to the teams to help offset travel costs to and from the World Championships. It is hoped, therefore, that those concerned will support the program by entering even if uncertain as to whether a trip to the Nats is possible or if a model will be ready in time—it's a worthy cause.

Meanwhile, attention is called to FAI weight and loading requirements which are somewhat more restrictive than those for AMA rules: weight of model, with fuel, must not exceed 11 pounds. Exception, CL only: multi-engine models must not exceed 15 lbs., 8 ozs. (no extra weight allowance for multi-engine RC models). Maximum surface loading (wing and tail area combined): for CL, 49.14 oz. per sq. ft.; for RC, 32.76 oz. per sq. ft. Note: surface area takes into account that area contained within the normal contours of the flight surfaces (wing and tail) extended so as to meet the plane of symmetry of the model (projection into fuselage, for example).

Maximum engine sizes: CL, .61 cu. in., except that multi-engine models may use up to 1.22 cu. in. total; RC, .61 cu. in. for either single or multi-engine models.

RC Scale PT-19A by Tommy Webb, above, was three years in making from much modified Sig kit—6-ft. span, 9 lbs. LaFoy Webb photo. Douglas M-4 Mailplane rubber-powered model, below, was 2nd in FF Scale for Dave Stott at 1969 Nats. Wingspan just over 30".

Above, Fred Mitchell explains features of his latest Formula II Mustang Pylon Racer during meeting of New England RC Modelers. Stu Richmond photo. Below, attractive CL Stunter by Michael Eber has Smoothie wing, Ares tail end, O.S. 35 engine. Photo by builder.

AMA Nomination Time

Between now and the date of the Nominating Committee meeting at the 1971 National Contest (specific date unknown when this was written) is the time for submitting names of candidate nominations for vacancies to be caused by expiring terms at the end of 1971. Such vacancies will be filled in an election later this year, the victors to be in office during 1972 and 1973.

Up for nomination this year is the national position of AMA secretary-treasurer and regional vice-president positions for districts I, III, V, VII, IX and XI. See the AMA district map on page 62 of the April AAM for the number of each AMA district and for a listing of current AMA officers.

Nomination Procedure. As per guidelines currently in effect it is required that any candidate for national office (president or secretary-treasurer) must have served, or shall be currently serving as either: elected officers of the AMA (such as vice-president) or as officers appointed by the president or the vice-presidents (such as Contest Board members, associate vice-presidents or committee chairmen). Also, it is required that a candidate be a Leader member (or Contest Director) of the AMA.

For elected district officers (vice-presidents) the same requirements are applicable, or either of two others may be substituted: Leader members recommended by vote of an AMA chartered club, or by a current Contest Director.

Names of all qualified candidates must be submitted in writing prior to the start of the Nominating Committee meeting. (These procedures should also be followed for re-nomination of current officers, if desired, or their names are not automatically placed on the ballot.) All such names will be considered by the committee, but only two names per office will be approved by the committee for listing on the ballot. However, the ballot will provide for write-in votes for any additional candidates who meet the requirements. Candidates are also urged to submit in advance, to the committee, any statements, documents or evidence supporting their nomination. Note: the Nominating Committee is made up of the elected district vice-presidents or their designated representatives.

Nominations may be submitted by any AMA member, in writing with a statement of at least 100 words concerning the candidate's qualifications, to the members' district vice-president, with a copy to AMA HQ. Consent of the person named should be obtained prior to submission.

This announcement is published at least 90 days prior to the annual Nominating Committee meeting in accordance with AMA by-laws.

Small Field Rules No Deterrent to FF Club

Flying sites suitable for Free Flight have become limited in most all sections of the country, and those that do exist are generally small, particularly near large cities. Clubs are faced with the prospect of changing contest activity to suit their field situations or going out of business. One way to change activity for smaller sites is to go into Control Line or Radio Control. Another is to choose (or modify) Free Flight events having flight performances equated to field size. The latter is what the Cloudbusters Model Airplane Club (Warren, Mich.) and many others have done, and quite successfully.

George Lewis was Contest Director for the AMA sanctioned Cloudbusters 10th Annual FF Meet last September. His words which follow show the club's current approach.

Flying sites in Michigan are becoming limited, and those that do exist are generally small. In past years our club, Cloudbusters, Inc., has sponsored large Free Flight meets, but as sites disappeared we felt that the nature of our meets had to change. Therefore, about four years ago we devised our "small field meet" having the following events:

¼A Gas (limited to engines up to .020)
HL Glider (standard AMA rules)
Unlimited Towline (any size or any weight; otherwise AMA rules)
Limited Rubber (any size or weight model, rubber motor limited to one-half ounce)

We established a two-minute flight maximum for all events, and a seven-second engine run for ¼A Gas.

As one of our goals we try to encourage entries by youngsters by providing Junior-only competitions in Limited Rubber and Hand Launch Glider, without any entry fee. And for these two special Junior events, prizes are given to all participants; this may mean an AMA Cub for 10th place, but it seems to pay off in the long run.

Two years ago, at the request of many modelers, we added AMA Rocket FF to the contest. This was received enthusiastically, and it now is a permanent part of the meet—very suitable for small field flying.

The 1970 Cloudbusters Annual Free Flight Meet had 64 contestants. There were 108 event entries and about 20 Junior-only entries. We really felt that we had bitten off more than we could chew when all those contestants showed up. However, with great forethought, we had Assistant Contest Director **Clarence Wentzel's** wife take charge of the flight cards. This precluded any arguments from any of the contestants as to who was in line to be timed! **Marcy Wentzel** did a great job for us. She received special recognition at our next club meeting.

The flying conditions on the day of our contest were great: partly cloudy, warm, but no thermals to speak of. As a result only one person maxed out, and that was in Towline. One of the Jr. contestants, a seven-year-old, had a 78-second flight with an AMA Cub! Another had a 42-second flight in HL Glider at an altitude of about 20 feet.

We think our contest concept is timely and lots of fun. Many have old rubber models gathering dust, such as the Sparky, Hawk, etc., that lend themselves well to ½-oz. Limited Rubber. Others have sport .020 Gas jobs for ¼A. Hand Launch Glider is always a popular event, and FF Rocket is easy to build and fun to fly. Nordic A-1's can fly competitively against A-2's with the two-minute maximum flight rule.

Our efforts to encourage Juniors has also seemed successful. We plan to hold this meet for many years to come, or at least as long as our site remains available.

Processing area at the 10th Annual FF Small Field Meet last year, above, as an entrant goes out for a Rocket-Powered flight. Below left, young ladies also flew—this one with dad's help. HL Glider flight about to begin, below right, by Open age entrant. HL always popular.

"I'll bet I can do that," is the apparent thought of these young watch a good flight.

AMA News Extra . . . . .

NATS DATES CONFIRMED, JULY 26-AUGUST 1

The 1971 National Model Airplane Championships is scheduled to take place aboard Glenview Naval Air Station, Illinois (just north of Chicago). This will be the 24th National Meet hosted by the U.S. Naval Air Reserve Training Command. This year's big meet is at the same location and at virtually the same time of year as the 1970 Nats which was hailed as one of the best ever. Mostly this year's Nats will be the same as in 1970 except for the following changes approved by the AMA's Nats Executive Committee and the AMA Executive Council at their February 25-26 meetings.

Radio Control. Besides Classes A & B, the upper class of Aerobatics this year will be Class C (was Class D in 1970). FAI Pylon Racing will be flown this year instead of Formula II. (There will be a noise standard applied to engines--which must be muffled--in FAI Pylon. Details will be reported in the near future.)

Indoor. Same events as last year, but scheduling has been reversed. Glider and Scale will be flown on Monday; Stick, Paper Stick and Cabin on Tuesday. Site was not confirmed when this was written--likely will be either the International Amphitheater (first choice) or the Washington Park Armory (1970 site).

Control Line. No change in events, but scheduling of Speed events is revised by moving 1/2A Speed, 1/2A Proto and 1/2A Profile Proto to Wednesday. Last year's Wednesday Speed schedule of A and FAI gets moved to Thursday, B and B Proto to Friday, and C and Jet to Saturday. The non-Speed classes continue as per last year's daily schedule.

Scale. All Scale events (Indoor, FF, CL and RC) will be run by AMA rules. This is not actually a change (AMA rules used last year), but earlier it was thought that CL and RC events might use FAI rules because U.S. Scale Teams are to be selected from Nats competition--not so; teams selection by AMA rules.

Registration Fees. The basic fee for all ages as well as the event fees for Juniors and Seniors will remain the same as last year although costs are expected to rise substantially. However, the event fees for Open age entrants are increased from $1 to $2 for FF, CL and Indoor events (advance registration basis), increased from $5 to $7 for RC events.

Berthing. Like last year, berthing will be limited to approximately 200 berths in barracks--males only. Tenting and trailering will again be permitted on the air station. No charge for Jrs. or Srs. but Open age category users of barracks and camping may be charged $1 per person per day.

Entry Forms will be available early in April. Requests for forms should include a self-addressed envelope with first class or air mail return postage affixed for each form requested. Such requests should be sent to AMA HQ, 806 Fifteenth St., N.W., Washington, D.C. 20005.

AMA RESERVATIONS PLAN FOR WORLD CHAMPIONSHIPS CHANGED

The AMA News section last month, page 55, told how motel reservations, as part of a package arrangement, could be made through AMA HQ. Since this information was prepared a new situation has developed which precludes going ahead with the motel part of the package--promises of a rebate to AMA for such reservations turned out to be based on an increase in motel rates rather than a discount. The result would have required members to pay more through AMA than separately--an unacceptable concept--so the group booking arrangement has been cancelled. Instead, AMA members are being advised to make their own arrangements, through the Geo. Washington Motor Lodge, Exit 27, Pennsylvania Turnpike, Willow Grove, Pa. 19090 (telephone (215) 659-7200). Rates quoted for next September: $16 single, $21 double. The Geo. Washington is the largest motel in the vicinity. It will be a secondary headquarters for the World Championships--all teams and officials will be at the primary motel near the contest site at Doylestown, Pa. The primary motel is already fully booked, so the G.W. is the next best place where most WC attendees will be staying. Note: AMA has pre-addressed and postage paid motel reservation postcards: request same from HQ.

New Booster Package. Since the motel reservations arrangement has been changed, a different package is being put together. This will offer parking, admission, identification and souvenir items. Availability of this package, however, has been delayed by delivery problems for some of the material. Price and package details will be announced as soon as AMA HQ is in a position to deliver upon receipt of orders. In the meantime, be sure to schedule your vacation to be on hand for the Seventh Aerobatic World Championships at Doylestown, Pa., September 15-19.

SUDDEN DEATH OF DISTRICT X VICE-PRESIDENT

We are saddened to report the untimely death of District X AMA Vice President Chuck Broadhurst in his sleep Sunday, February 28, the day he returned home to Sacramento, Calif., following attendance of the AMA Executive Council meeting at Toledo, Ohio. His presence in guidance of AMA policy will be sorely missed as, assuredly, it will be missed by the National Free Flight Society, of which he was executive director. We join with his family and all modelers who knew him in expressing our heartfelt sorrow.

By special arrangement with the publisher this page is produced at the very last minute, just before the magazine is printed, to bring you the latest news concerning current Academy of Model Aeronautics events of national significance.

Left, unusual FF Scale subject by Bill Hannan is an Avro/Cierva C. 17 autogiro powered by a Cox .02 engine. Photo by the builder. Two pretty subjects below: Brenda Deremer poses with hubby Bob's Trainermaster. Plane has Supertigre .46 power, Kraft KP-4 radio, Kavan wing fairings, butyrate finish. Many trouble free flights reported. Bob Deremer photograph.

CONTEST CALENDAR

Official Sanctioned Contest of the Academy of Model Aeronautics

April 3-4—Dunnellion, Fla. (AAA) Florida State FF (Cat. II) & CL Championships. Site: Dunnellion. R. Fritz CD, 3812 Pelican Ln., Orlando, Fla. 32803.

April 4—Rockledge, Fla. Spaceport RC'ers Fun-Fly. Site: Barnes Blvd. P. Coyle CD, 403 Abbott Ave., Titusville, Fla. 32780. Sponsor: **Spaceport RC'ers.**

April 10—Cambridge, Mass. Tech Model Aircrafters Annual Indoor (Cat. II) Meet. Site: MIT Armory. R. Hurlan CD, 15 Happy Hollow Rd., Wayland, Mass. 01778.

April 11—Gainesville, Ga. (A-Entry Restricted) Gainesville Hall Model Flying Assn. CL Meet. Site: Gainesville. C. Sikes CD, 207 Highland Terr., Gainesville, Ga. 30501.

April 14—Van Nuys, Calif. (AA) Valley Circle Burners FAI CL Meet. Site: L. A. Model Airport. W. Netzeband, Jr. CD, 580 N. Holliston, Pasadena, Calif. 91106.

April 17-18—Taft, Calif. (AA) Thermal Thumbers 3rd Annual Silent Flight FF (Cat. I) Meet. Site: Taft. I. Aker CD, 8008 Leilani Ln., Cypress, Calif. 90630. Sponsor: **Thermal Thumbers.**

April 18—Phoenix, Ariz. (A) Spring FF (Cat. II) Contest. Site: Pinnacle Peak. W. Morris CD, 7422 E. McKinley St., Scottsdale, Ariz. 85257.

April 18—Dallas, Tex. (AA) 1st Dallas RC Warm-up. Site: Samuels Park, East. B. Aker CD, 303 E. Rotan Ln., Dallas, Tex. 75220.

April 24-25—Daytona Beach, Fla. (AA) Daytona Eagle-Beagle CL Meet. Site: Daytona Beach. H. Lambert CD, 1312 Gulfview Dr., Daytona Beach, Fla. 32014.

April 24-25—College Station, Tex. (AA) Second Annual TAMMAC Spring FF & CL Meet. Site: TAMMAC Field. J. Bell CD, Box 289, Naumora, Tex. 77868. Sponsor: **Texas A & M M.A.C.**

April 25—St. Louis, Mo. (A-Entry Restricted). Spirit of St. Louis Dawg Races. Site: Spirits RC Field. W. Butters CD, 2505 Bradwell, Florissant, Mo. 63033. Sponsor: **Spirit of St. Louis RC Club.**

May 1-2—Arlington, Tex. (AA) Mother's Day Annual FF Meet. Site: So. Arlington. M. Fedor CD, 1926 Balla Way, Grand Prairie, Tex. 75050.

May (2)—Hicksville, L.I., N.Y. (AA) L.I.M.A.C. Indoor (Cat. II) Championships. Site: Cantiague Park. J. Pallet CD, 30 Emerson Rd., Brookville, Glen Head, N.Y. 11545.

May 2—Lakehurst, N.J. (AA) MMAC Pattern RC Contest. Site: Lakehurst N.A.S. R. Roane CD, 311 Beers St., Keyport, N.J. 07735. Sponsor: **Monmouth Model Airplane Club.**

May 2—Tucson, Ariz. (AA) CCMAC Spring CL Invitational Meet. Site: Rodeo Park. T. Snow CD, 3408 N. 2nd Ave., Tucson, Ariz. 85705.

May 2—Wichita, Kans. (AA) 4th Annual Wichihawks Spring FF Rally. Site: 13th & Webb Road. M. Tallman CD, 3014 Exchange, Wichita, Kans. 67217. Sponsor: **Wichihawks.**

May 2—Hadley, Mass. (AA) Hampshire Showdown Air RC Races. Site: H.C.R.C. Flying Field. F. Mitchell CD, 200 Notre Dame St., Westfield, Mass. 01085. Sponsor: **Hamashire County RC'ers.**

May 2—Washington Crossing, N. J. (A-Entry Restricted) Del. Valley Fed. of M.A.C. FF Bash. Site: Washington Crossing State Park. T. Kerr CD, 7824 Lexington Ave., Philadelphia, Penn. 19152. Sponsor: **Philadelphia Sky Pirates.**

May 2—Council Bluffs, Iowa (AA) Mid-western Spring CL Warm-Up. Site: Iowa School for Deaf. D. Hutcheson CD, 317 Spencer Ave., Council Bluffs, Iowa 51501 Sponsor: **Balsa Busters.**

May 8-9—Baton Rouge, La. (AA) Baton Rouge RC 10th Annual RC Contest. Site: Club Field, Pecue Lane. H. Roberts CD, 9243 Hampton Way, Baton Rouge, La. 70814.

May 8-9—Huntsville, Ala. (AA) 11th Annual Rocket City RC Meet. Site: Old Huntsville Airport. C. Schofield CD, 2709 Briarwood Dr., S. E., Huntsville, Ala. 35801. Sponsor: **Rocket City RC** [illegible].

May 8—Fort Worth, Tex. Fort Worth Thunderbirds RC Pylon Races. Site: T-Bird Field. B. Simpson CD, 5709 Wharton, Fort Worth, Tex. 76133.

May 9—Van Nuys, Calif. (AA) Valley Circle Burners FAI [illegible] Meet. Site: L. A. Model Airport. W. Netzeband, Jr. CD, [illegible] N. Holliston, Pasadena, Calif. 91106.

May 15-16—Lafayette, La. (AA) Third Annual CL & RC Model Aviation Day. Site: Stutes Ford. J. Molan CD, P.O. 52344, Lafayette, La. 70501. Sponsor: **Acadian RC** [illegible].

May 15-16—Jacksonville, Fla. (AAA) Rebel FF, RC and CL Rally. Site: Imeson Airport. F. Carney CD, 1839 Loyola Dr., Jacksonville, Fla. 32218.

May 16—Monmouth County, N.J. (AA) 3rd Annual R/C Soaring Meet. Site: To be announced. R. Serpolus CD, 32 Alameda Ct., Shrewsbury, N.J. 07701. Sponsor: **Monmouth Model Airplane Club.**

May 16—Downers Grove, Ill. (AA) 5th Annual AA CL Meet. Site: 39th & Fairview Park. R. Phillips CD, 4431 Stonewall Ave., Downers Grove, Ill. 60515. Sponsor: **Treetown Modelaire.**

May 16—W. Suffield, Conn. (AA) Nor-East RC Air Races '71. Site: NCRCF Field. A. Simmonds CD, 145 Irene Dr., RFD #4, Vernon, Conn. 06066. Sponsor: **Northern Connecticut RC Club.**

May 22-23—Council Bluffs, Iowa Cobra's first Annual RC Fun-Fly. Site: Club RC Field. H. [illegible] CD, 924 Avenue J, Council Bluffs, Iowa. 51501. Sponsor: **Cobra's Radio Control Club.**

May 22-23—Lafayette, La. (AA) Third Annual Model Aviation CL & RC Day. Site: Comeaux High School. J. Molan CD, P.O. Box 52344, Lafayette, La. 70591. Sponsor: Acadian Radio Control Club.

May 23— Gainesville, Ga. All South RC Airplane Water Carnival [illegible] Picnic. Site: Gainesville. L. Purdy CD, Oakwood, Gainesville, Ga. 30566.

May 23—New Castle, Penn. P.O.R.K.S. Inc. 12th Annual RC Fun-Fly. Site: P.O.R.K.S. Field. Z. Allerton CD, 124 Richellew Ave., New Castle, Penn. 16101.

May 23—Near Kerman, [illegible]. (A) Fresno Monthly FF Gas Meet. Site: Near Kerman. F. Gallo CD, 1725 Kenmore Dr., W., Fresno, Calif. 93703. Sponsor: **Fresno Exchange Club.**

May 23—E. Granby, Conn. (AA) Sailplane RC Snow Gaggle. Site: NCRCC Field. [illegible] Gordon CD, 75 Brookhaven Dr., Glastonbury, Conn. 06033. Sponsor: **Northern Conn. Radio Control Club.**

May 23—Wheeling, Ill. (A-Entry Restricted) Red Baron's F.V.M.A.A. Annual CL Meet. Site: Pending. H. Cain CD, 325 Weidner Rd., Buffalo Grove, Ill. 60090. Sponsor: **Red Barons Model Airplane Club.**

May 29—Union, N.J. (AA) 17th Union Model Airplane CL Invitational. Site: Morrison Field. F. DeCicco CD, [illegible] Broadview Ave., Maplewood, N. J. 07040.

May 29-30—Schenectady, N.Y. (AA) Empire State RC Championships. Site: Schenectady County Airport. A. Sartler CD, 29 Waldorf Pl., Schenectady, N.Y. 12307.

May 30—Chardon, Ohio (AA) C.R.C. "500" RC Pylon Races. Site: Club Field. F. Vidmar CD, 26500 Zeman Ave., Euclid, Ohio 44132.

June 5-6—Spencerport, N.Y. (AA) 12th Annual N.Y. State RC Championships. Site: Spencerport. T. Salvemini, Sr., CD, 6 Valley Ln., Avon, N.Y. 14414. Sponsor: **Radio Control Club of Rochester, Inc.**

June 5-6—Dahlgren, Va. (AA) National Capitol RC Tournament. Site: Naval Weapons Lab. B. Violett CD, 64 B, Rt. 1, Clarksburg, Md. 20754.

June 5-6—Lincoln, Neb. (AA) Lincoln Sky Knights 12th Annual Midwestern Open RC Meet. Site: Arrow Airport. R. Brimhall CD, 630 Broadview Dr., Lincoln, Neb. 68505.

June 5-6—Nashville, Tenn. (AAA) Mid-South 8th Annual RC Championships. Site: Percy Warner Park. B. Reuther CD, 216 Vaughns Gap Rd., Nashville, Tenn. 37205.

June 5-6—Cleveland, Ohio (AAA) The Cleveland Sport Races and 4th Annual "500" and FAI CL Team Selection. Site: Cleveland Model Flying Field. A. Montagino CD, 5863 #11, Big Creek Pkwy., Cleveland, Ohio 44129.

June 5—Little Rock, Ark. (A-Entry Restricted) 2nd Annual MARCS Fun-Fli. Site: Little Rock. F. Osborne CD, 18 Mohave, N. Little Rock, Ark. 72116. Sponsor: **Mid-Arkansas Radio Control Society.**

June 6—Hadley, Mass. (AA) Hampshire Showdown RC Air Races. Site: H.C.R.C. Flying Field. R. Harkowski CD, 32 Lyman St., East Hampton, Mass. 01027. Sponsor: **Hampshire County RC'ers.**

June 6—Bristol, Conn. (AA) Hornets Model Classic CL Meet. Site: Edgewood School. J. Scott, Jr. CD, 265 Witches Rock Rd., Bristol, Conn. 06010. Sponsor: **Hornet's Model Airplane Club.**

June 5—Lancaster, Ohio FORKS [illegible] Midget RC Pylon Meet. Site: FORKS Field. J. Slater CD, 809 Forest Rose Ave., Lancaster, Ohio 43130. Sponsor: **Fairfield Ohio** [illegible] **Kontrol Society.**

June 12-13—Elkgrove, Ill. (AA) 10th Annual Chicagoland RC Contest. Site: Mile E. of Rt. 53 on Higgins Road. D. Wehrheim CD, 1841 W. Fletcher St., Chicago, Ill. [illegible]057. Sponsor: **Chicagoland Radio Control Modelers, Inc.**

June 12-13—Houston, Tex. (AA) Houston RC Club Annual RC Contest. Site: Mabray Field, B. Striegler CD, 5831 McKnight, Houston, Tex. 77035. Sponsor: **Houston Radio Control Club.**

June 12-13—Ollville, Va. (AA) R.A.R.C. 11th Annual RC Contest. Site: RARC Field. C. Foreman, Jr. CD, RFD #4, Box 683, Mechanicsville, Va. 23111. Sponsor: **Richmond Area Radio Control Club, Inc.**

June 12-13—Kansas City, Mo. (AA) Kansas City RC Annual Meet. Site: Lake Jacomo. B. Drummond CD, 9115 Charlotte, Kansas City, Mo. 64131. Sponsor: **Kansas City Radio Control Assn.**

June 13—Endicott, N.Y. (AA) 6th Annual Northeast RC Pylon Championships. Site: Tri-Cities Airport. R. Noll CD, [illegible] Pine Knoll Road, Endicott, N.Y. 13760. Sponsor: **Aeroguidance Society, Inc.**

June 13—Chagrin Falls, Ohio (AA) 7th Annual E.M.A.A. Old Timer FF Contest. Site: Savage Road. V. Didelot CD, 32997 Charnwood Oval, Solon, Ohio 44139.

June 13—VanNuys, Calif. (AA) Valley Circle Burners FAI CL Meet. Site: L. A. Model Airport. W. Netzeband, Jr. CD, 580 N. Holliston, Pasadena, Calif. 91106.

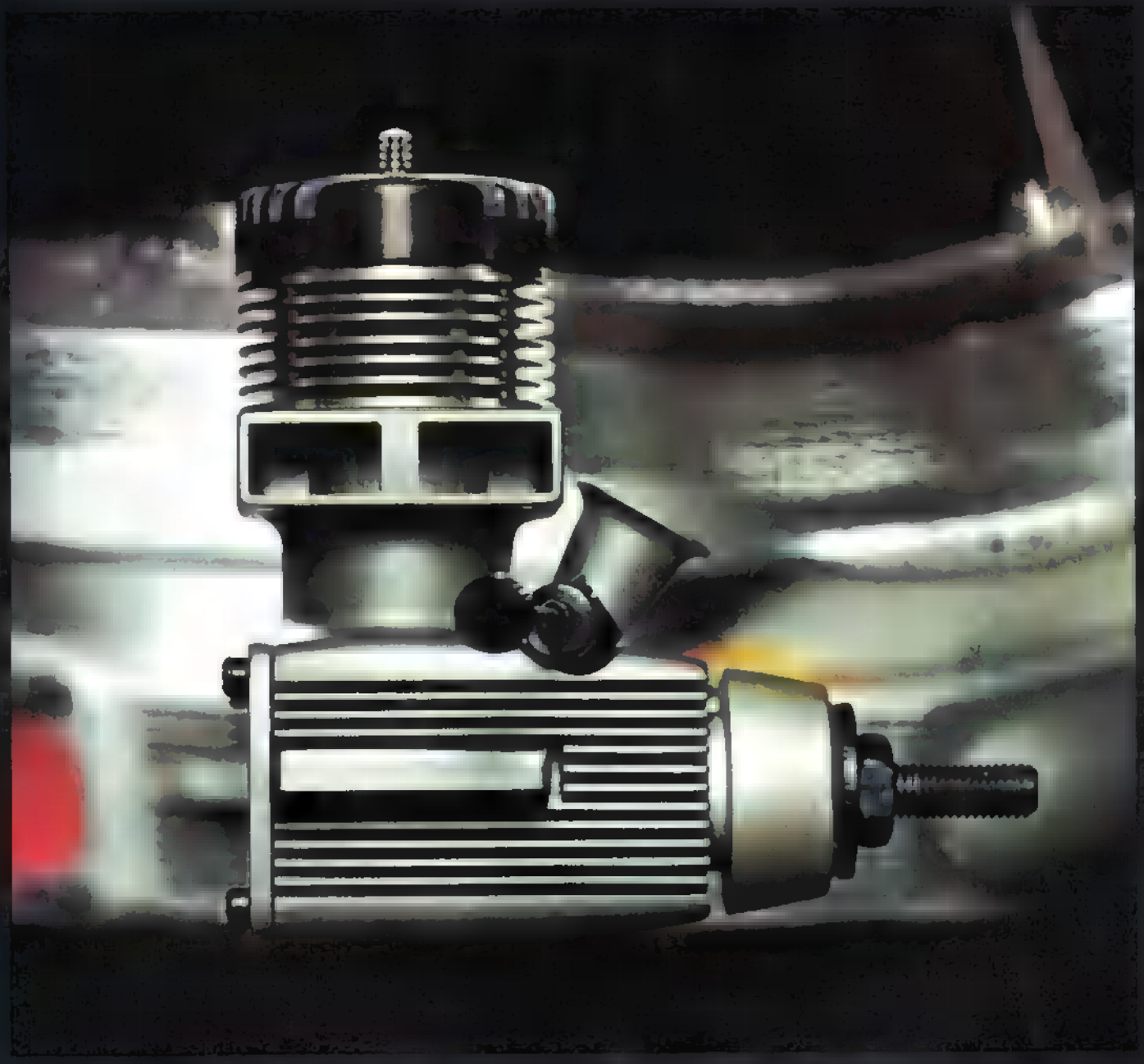
June 13—Hadley, Mass. (AA) Hampshire County Thermal-Aires Meet for Thermal RC Glider. Site: H.C.R.C. Flying Field. J. Papageorge CD, 104 Rocky Hill Rd., Hadley, Mass. 01035. Sponsor: **Hampshire County RC'ers.**

June 13—Lakewood, N. J. Novice Only RC Meet. Site: Lakehurst N.A.S. A. Schroeder CD, 18 Spencer Rd., Glen Ridge, N.J. 07028.

June 13—Harvey, Ill. (AA) Chicago Model Masters Model CL Meet. Site: Dixie Square Parking Lot. W. Webb CD, 15722 Vine Ave., Harvey, Ill. 60426.

June 13—Council Bluffs, Iowa (AAA) Eighth Annual CL Model Meet. Site; Iowa School for the Deaf. J. Dreier CD, 1915 Ave. B, Council Bluffs, Iowa 51501. Sponsor: **Balsa Busters.**

TERRIFIC!....BUT LOOKS AREN'T EVERYTHING



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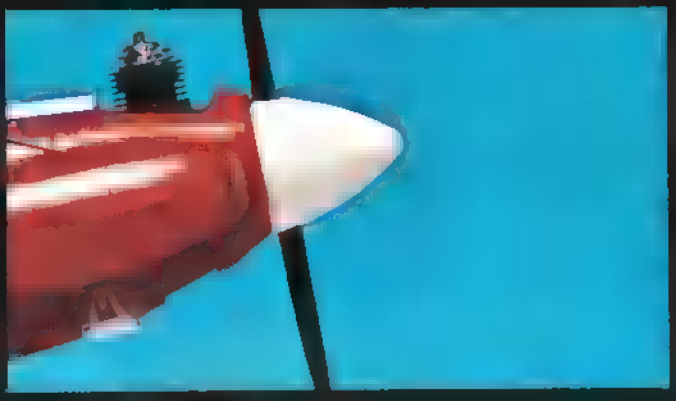

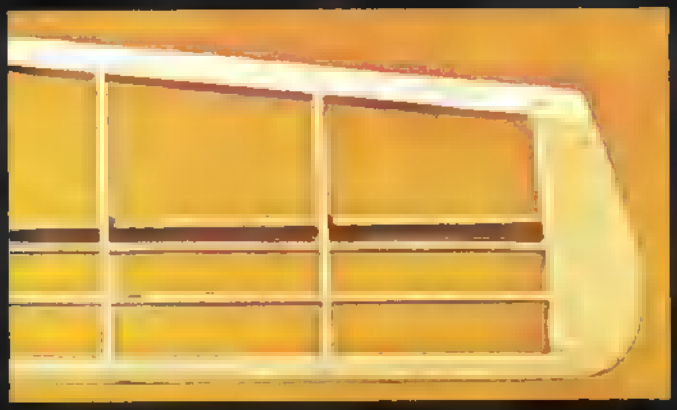

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Col. Kearby's Thunderbolt

(continued from page 23)

using drawing ■ guide ■ to placement of tape. Cuticle scissors are helpful in cutting wavy lines for the pattern. Spray or paint olive drab. If, after removing tape, there is a little paint buildup around the color separation line, remove it by sanding lightly with No. 400 wet or dry.

Paint the tip of the vertical stabilizer blue, then with the smallest brush paint the olive drab outline around the trim tabs on rudder and elevators.

At last the results of all the hard work can be seen, as the small parts are assembled and cemented into place. Cut the decals ■ close to the color line ■ possible and apply, using extreme care in placing them.

A suggestion for displaying: Beside the plane, place a typed plaque, stating type of aircraft, pilot of plane, theater of operation, date and specifications. This will give a capsule history.

Research sources include: Aero Series No. 6, "Republic P-47 Thunderbolt;" Profile Publications No. 7, "Republic P-47D." Decals are from Authenticals Decal Sheet No. 4 (1/72 scale, P-47) which gives detailed information. See also "Dick Bong—Ace of Aces," by Gen. Geo. C. Kenney.

The September 1968 AAM has a full-color centerspread of another great P-47. This was Lt. Col. Francis S. Jabreski's P-47D-25 in European War Theater camouflage. Available from AAM, 60¢ each.

Troop Glider

(continued from page 34)

The tow release is a simple third-line-operated device consisting of a base and latch, spring-loaded in the closed position, and actuated by the third line on a compound bellcrank as described in the March 1969 AAM. This assembly is easily made but it must work smoothly to assure consistent operation.

Begin by making the base of 1/32" aluminum, as shown. As an alternative, 1/8" plywood may be used. When the tow-release base has been made and bolted with 4-40 screws to the control platform, solder the 1/16" dia. wire latch to the 3/32" dia. brass tube pivot. Then, after putting the .025 torsion spring into position, mount the latch assembly to the base with a 1/16" wire pin. The upper end of the latch is secured by a length of leadout cable to the third line bellcrank. Assemble the landing gear mount to the control platform.

Next, add the tow release and compound bellcrank to the control platform and hook up the controls. Assemble the sides to the platform and add the crossbraces to give the fuselage its boxy shape. Finish roughing out the fuselage by covering the bottom, placing wing strut wire, and adding the tail wheel. If a two-piece strut, spliced in the center with brass tubing, is used, the struts may be left off until later. The pushrod, elevator and stabilizer are assembled before the top of the fuselage is covered with 1/8" sheet balsa. The nose is carved from blocks for needed weight, although a nice touch would be to stretch-form the nose from clear plastic. This nose can be hinged, as the real ship's was, or detachable with dowel pegs and rubber bands to permit access to the tow hook and control system.

For all tail surfaces, use 1/8" hard sheet to save weight in the tail, even though the plan shows the thicker section of the real airplane.

The straight wing is built with a full-depth notched spruce spar and notched leading and trailing edges. Provide holes in the root and adjacent ribs to accept the dowels from the fuselage. The scale fan may wish to cover the entire wing with sheet balsa, since the real ship used wood-covered wings. The wing is covered and assembled to the fuselage by sliding the two wing panels over the stubs from the fuselage and epoxying the wing struts in place in the drilled blocks provided. Balsa fairings then may be fitted to these struts.

The fin and rudder construction completes the ship, and such details ■ landing gear fairings, pitot mast and line guide may be added.

Finish techniques may vary. I gave the model two coats of clear, then covered it overall with lightweight Silkspan. After another two coats of clear, it was nicely prepared for a final two coats of olive drab. Use fuel-proof finish products because this model will be around glow-engined planes, fuel, and greasy modelers.

The CG-15 requires much ballast secured to the front of the bellcrank mount. Proper glider balance ■ most important, and controls and tow release must function smoothly.

To provide thrust, begin by making up ■ 25- or 30-ft. tow lien of strong, approximately 1/16" dia. nylon cord. Use grommets in the loops to minimize wear. To prevent loosening, bind the ends, which have been coated with PlioBond cement, with thread. Regular line connectors go into the grommets at each end. A connecting link is

bent from 1/32" wire and passes through the eyelet in the glider's nose to secure this tow line (via line connector) to the tow release within. A pull on the third line raises the tow latch, which releases the connector link, which then slips out of the nose. At this point, the glider is on its own.

If the CG-15 has been built to scale and properly balanced for flight, the glider will tend to slide on its upholstery tack nose skids during takeoff and landing rollouts. This should cause no difficulty. Many real gliders did slide for some distance on their noses. The main wheels can be moved about an inch forward and eliminate the slide, if desired.

Curtiss C-46 Commando

The Curtiss C-46 Commando is scale in outline, but a profile in fuselage. Begin by assembling the control system (compound bellcrank, throttle cranks, etc.) to the bellcrank mount which is then placed on the lower wing skin of the center section. The leading and trailing edges are then attached, as are the lower spars, then ribs and upper spars. The center section is finished with the upper skin and nylon covering. This seemingly backward assembly procedure allows for much easier assembly of the controls.

The outer panels are conventional and must be attached with great care to the center section dihedral braces. They are covered with Silkspan, using plenty of glue and gussets at the dihedral breaks.

The fuselage starts out as a 1/2" thick profile fitted with 1/4" thick "cheeks" to round it out somewhat in the manner of the double bubble section of the real machine. The area of 1/2" wood between the cheeks is removed to provide material for the profile engine nacelles and to reduce weight.

With the fuselage carved and sanded, the 1/8" plywood wing doublers are epoxied around the wing opening and the wing slid through and epoxied into position. Lengths of 1/4" dowel are used to peg the wing into place by drilling through the bottom of the fuselage, through the center rib, and on upward 1/2" into the fuselage. The nacelles are attached in a similar manner, since it is important to minimize vibration in a twin. When the wing and fuselage assembly is complete, the tail surfaces and tail wheel are added. On my model, the tail wheel wire and tow hook are one piece.

The Commando is colored olive drab on top and gray underneath. With decals and markings in place, the model is ready for mounting engines, landing gear, etc. The use of 1 1/2-oz. control line Goodyear fuel tanks is recommended, because the quick-fill attachment permits easy topping off of fuel tanks with the engines running. Tanks must be mounted so that the fuel pickups of both tanks are to the outside of the flying circle.

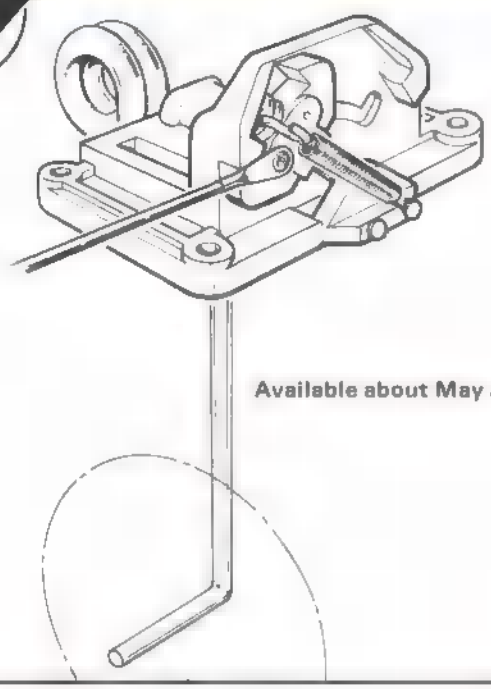
The landing gear shown is scale length, but the three-blade 9-6 nylon props are cut down to 7" dia. to provide ground clearance and sufficient thrust. The landing gear can be lengthened if desired.

Flying

Most control line models can be flown as gliders, and most can tow too. There is nothing mysterious about this operation, but both planes must be stable, and the glider must have a suitable means for cutting loose from the tow. Throttle control on the tow plane is desirable, but not essential.

The pilots must cooperate closely and both

CARL GOLDBERG



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LOWEST PROFILE - Main Gears are only 1" high.

LIGHTEST - 2 Mains with 5/32" wire struts only 3 oz., Nose Gear, 2 Mains, and 3 struts, only 5 oz.

BROADEST BASED for best distribution of stresses, both fore and aft, and laterally.

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SIMPLEST - Main Gear has only 3 molded parts, 2 springs, 5/32" music wire strut, 4 screws.

EASY Installation or Strut Removal. Low actuating force required - one servo can actuate all three units.

COST?? Unbelievable! But True!
Special Low Introductory Price
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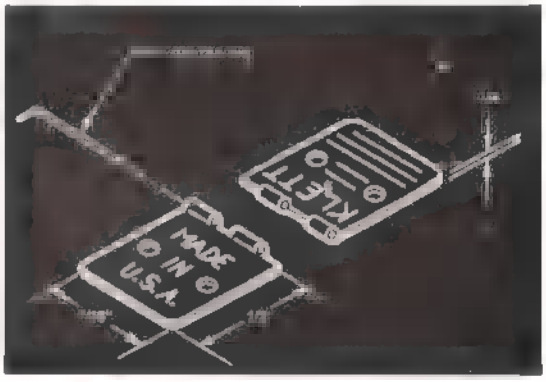
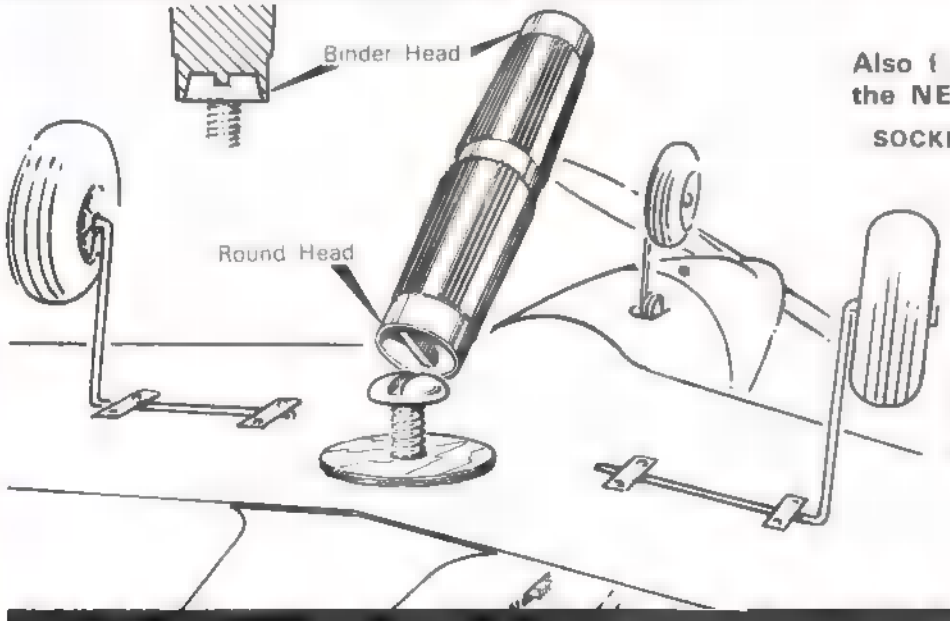
Designed and Manufactured by Roy Klett, originator of the World-Famous RK Hinges!

When the RK Hinges were first introduced several years ago, they were instantly accepted by modelers everywhere as the answer for smooth operation of control surfaces. Very shortly they were copied by manufacturers in the U.S. and in other parts of the world. The quality, however, has never been equaled because of the exceptional care and attention to detail by the designer, Roy Klett. Now, he has designed and is manufacturing his new RK2 Hinges which are smaller and extremely strong — and so thin that all you need is a knife slit for them. Note the dimensions, especially the thickness. These hinges are the absolute top quality, yet the price is only $1.95 for 15, and $1.10 for 7. Exclusively marketed by Carl Goldberg Models.





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must realize that if the glider ■ permitted to fly higher than the tow ship, the tail of the tow plane will be drawn up and ■ may dive. Conversely, if the glider is low, the tow plane will nose up. Thus, the glider must be flown at the same altitude as the tug. At all times, the tug must be flown fast enough to provide adequate control for both planes. The glider pilot must be alert for difficulties with either airplane so that he can cut loose and thereby avoid ■ double crash. Each airplane exercises a great influence on the flight of the other.

To fly, the control lines are hooked up and the glider stationed on the runway at the end of the tow line. The tow plane's engine(s) must be thoroughly warmed up. When the engines ■■ running and ready for flight, the glider is rolled back to draw the tow line tight.

The Commando is flown on .015" x 60' lines, the CG-15 on .008" x 60'.

When both pilots agree they are ready, the helper releases the tow plane, remembering to step quickly out of the way of the glider which will be coming by shortly. (Don't leave batteries behind the tug!) The tow plane ■ flown off in the usual manner, with the glider, which may tend to take off sooner, flying smoothly behind. To prevent control difficulties with either model, the pilots must discuss climbing and diving before performing them.

The glider is landed by pulling the third line, thus releasing the tow line, and is handled like any dead-stick control line ship. Once the glider is gone, the tow plane will behave like an ordinary model. Just don't land it on the glider.

IN THE WATER! 3 IN THE AIR!

KIT B-22M
34.95

YACHT AMERICA

LENGTH: 51½"
HEIGHT: 41"
BEAM: 8½"

Single Channel Rudder Control to Full House Rudder & Sail, etc. Operation

A FINE OPERATING SAILING MODEL . . .

This magnificent model is a true scale replica of the YACHT AMERICA as it was rigged between 1851 and 1859. Designed by George Steers, and built by W. H. Brown of New York, it was launched May 3, 1851. At 170 tons, it was 95'6" long, 23' beam and had an 11'6" draught. In June, the AMERICA sailed across the Atlantic to accept the challenge of the British Royal Yacht Club to a race around the Isle of Wight. The victor would win the Hundred Guinea Cup, which is now known as The America's Cup. The win of the race around the Isle of Wight started The America's Cup Races which has been successfully defended by American vessels for over 100 years. The AMERICA served both sides with distinction in the Civil War. It was destroyed in a collapse of a protective shed in 1944. Kit features accurately die cut Balsa and imported Birch plywood that makes assembly relatively easy for most anyone. Other features are • Die-Cut Birch Plywood Decks with planking grooves printed in • Tapered Masts, Booms, Spars, etc. • Miniature Rope in scale size and color • Fine quality Sail Cloth • Chain • Dozens of exquisitely detailed Cast Metal Fittings, as well as Hardware and Special Metal Fittings for rigging • Simple step-by-step Plans showing all phases of construction and operation

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High Performance
Radio Control Model

SPAN: 56" AREA 525 sq in WEIGHT: 2½ lbs. (Less R/C) ENGINE: .29 to .45

ASSEMBLES QUICKLY AND EASILY . . .

Years of design refinements and flight testing have gone into this superb flying machine. Beautifully [illegible] RIMFIRE builds fast with its Table-Top Warp-free construction into a rugged and exceptionally [illegible] ship. [illegible] RIMFIRE! [illegible] RIMFIRE Kit contents • Full length One Piece Die Cut Fuselage Sides • Full length Carved and Hollowed Fuselage Top • Formed Gear includes Steerable Nose Gear assembly • Hardware includes all special Nylon R/C fittings, threaded Rods, as required for COMPLETE LINKAGE • ALUMINUM ENGINE MOUNTS • Canopy • Decals • Wood Nut & Nylon Screw Wing Mounting • Shaped Ailerons • Simple step by step Plans, etc. etc.

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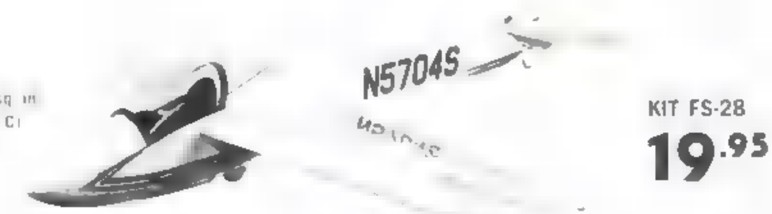

SPAN: 70" AREA 500 sq in
WEIGHT: 1¼ lb. (Less R/C)
SCALE: 1½ in = 1 ft

KIT FS-28
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SCHWEIZER 1-26D R/C SAILPLANE

Unbelievably realistic and unusually responsive to R/C command, with excellent penetration. The magnificent silent flight must be seen to be appreciated. Power Pod material included. Superb engineering is reflected in the rugged Easy-to-Build assembly and Warp-Resistant construction. Beautifully pre-fabricated with many finished parts, this kit features • Top quality Balsa, extensive use of imported Birch plywood as required structurally, all cleanly and accurately Die Cut • Hardware includes all Nylon R/C fittings required for Full House linkage • Crystal clear Canopy • Turned Nose Cone • Scale Decals • Simple, yet complete step-by-step Plans and Instructions, etc., etc. DETACHABLE WING PANELS FOR EASY TRANSPORTATION.

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Sterling Nylon Fittings are manufactured from pure virgin nylon. Nylon used is the most solvent resistant type and is insoluble in common acids, oils, greases, etc. Molded to exact specifications, these Fittings are tough and extremely durable. The use of Sterling Nylon Fittings on Radio Control Models is highly desirable, since it eliminates electrical noises.

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We have more surplus 4 ampere hour nickel cadmium wet cell starting batteries. These are unused surplus, and have been filled, but will need to be charged before initial use.

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Will you money in the starting of your Glo Engine and may be adapted for this with any of the available type of connectors.

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ACE R/C INC.

Dear Friend:

How does that picture above grab you? Pretty exciting, isn't it? That's new Upstart designed by Owen Kampen and featured in May RCM.

Uses Ace foam wing with .049 engine and channel equipped, (new two channel digital outfits that appearing the market--or of an existing system for lightweight) and you've a racing machine. And on rudder and elevator it gives all the thrills and racing fun.

The 1/2 Midget Racer concept being developed is designed to feature just rudder and elevator, and use specific tank capacity.

This puts R/C racing into the just plain fun category, also puts in the of thousands of people who clear it was something they felt they could not handle because of the speeds, the high expense involved, the complexity of building, and the feeling that "I might well try, because I don't have a chance!"

Ace will announcing a kit for the custom Upstart next month with price and date.

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Ace has long a leader in promoting fun in radio control and promoting it a hobby instead of a highly competitive, professional, "sport".

We still lead way in the simple system with our Rudder-Only. We're happy say R/O Pulse is growing fast, and more people are getting introduction into this fascinating hobby than almost any other means.

Our Dick's Dream kit, our foam wings, as well as our plans for rudder-only planes, AND our dependable simple systems, are contributing factors.

We have thousands of satisfied customers, but quote from innumerable letters of people who also have the high priced digital but have also purchased a simple R/O system to fly "just for fun".

If you seriously considering R/C a hobby, we urge you to give serious thought the "simple system" that Pulse Rudder Only affords.

Yours sincerely,
Paul

Paul F. Runge

DICK'S DREAM PLANE KIT
For the Beginner Expert!

NOW! A Mini Foam Wing Airplane Kit. This is first! DESIGNED FOR PULSE!

There foam wing kits on the market, but with the Ace Mini Foam Wings, small planes in the 30-35" range fill for something that did not exist in the kit field.

This kit of the Dick's Dream, designed by Owen Kampen. Has been extensively test flown over a period of years by a number of modellers in various parts of the country. The Dick's Dream is partially a scaled down Whiz Kid--a proven performer. It has several innovations which for the small breed of airplane specifically, and with the foam wing the beginner is assured of overcoming a big drawback to success. Features crutch type fuselage construction to line-up and accuracy.

and hardwood parts specially selected clean precision cut by Lou Andrews of Aamco especially for this kit. This you of quality and integrity. Wire parts for landing and torque rod, hinge material, and other extras supplied. Wheels and engine mounting hardware not.

Full step by step instructions to assist in building this gem of a kit, AND ultra simple installation shown for the Commander R/O Baby or Baby Twin!

Span is 32" (cut from the Ace constant chord foam section), 5½" chord, length is 25 inches. Weight with R/C gear is 12 to 14 ounces.

With a .020 and a Commander R/O Baby you have a docile performer and excellent trainer. If you want something hot, TeeDee .020 with the Commander R/O Baby Twin will do the job--it'll do everything in the Rudder Only book!

Excellent for the beginner--fun for the experienced flyer. Join in with of satisfaction with new Ace Foam Wing Dick's Dream.

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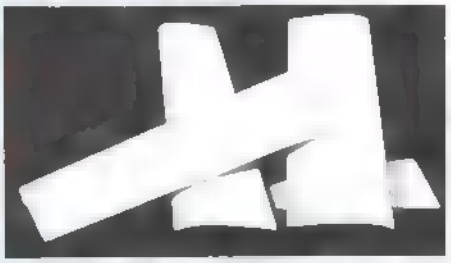

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Special 17% semi-symmetrical airfoil expanded foam developed by Owen Kampen for the small planes.

The constant chord measures 35" span, width is 5½". Area 192.5. Weight about

The taper section 35" span, center is 5½" which tapers to 4". Area 166.24. Weight just over 2 oz.

Come in two 17½" pieces which may be easily epoxied for desired dihedral. May be used unfinished. Or may finished with polyurethan varnish. Stripe with Monokote for trim.

Build small with foam. Makes planes which are ideal for the Cox Pee Wee or TD .020 engines, and the Commander R/O Baby or Baby Twin units.

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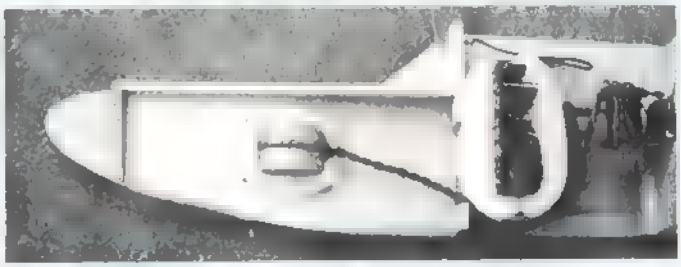

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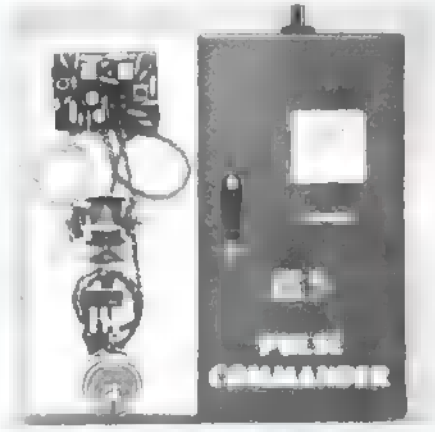

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** COMBOS with batteries AND charger!

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To help the beginners, we also offer the usual combos which contain the Basic Pack (A) plus the Battery & Charger Kit (B-C) which have proven be the best all-around combinations.

The Basic Packs contain the new improved Dickerson Designed Rudder Only Pulse Transmitter, Commander 2,4 v superhet receiver, and four choices of size on more powerful Adams actuator.

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The Baby is for .010 to .020 jobs. Airborne weight 2.5 oz. (If you 225 ma nicads).

The Baby Twin is for hot .020 to .049 jobs. Airborne weight 2.9 oz. (If you use 225 ma nicads).

Use the Standard for more power for hot .049 to .09 power. Airborne weight 4.5 oz. (If you use 500 nicads).

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Specify frequency: Available on 26.995, 27.045, 27.095, 27.145 or 27.195)

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The two kits you need to make up any of the four R/O Packs to come up with the Combo of your choice. Consist of 2,4 Nicad Battery Pack in either of two sizes (you CAN pen cells, but we don't recommend it), Mallory M1603 Transmitter Battery, and Deluxe Charger complete with submini jack and plug. Charger is transformer isolated for your protection.

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Completely assembled.

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No. 0992, Fouga Cyclone Scale model of jet-assisted French sailplane, by Nick Ziroli Gains altitude easily on 09 engine. A two-piece 7-ft. wing. For R/C. **$3.50**

No. 0993, La Jollita Profile 15-powered Goodyear C/L racer by James Kloth, fast, groovy On mild fuel and engine does 85 mph. **$1.25**

No. 0892, Taylor Cub F-2 Sport, F/F, scale, .020, Stick-and-tissue. By Schreyer. **$1.75**

No. 0893, Martin MO-1 Rare WW-I era monoplane, carrier fighter ideal for Class I Carrier Ailerons keep lines tight at low speed. By Reeves. **$1.50**

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No. 0692, ½A Sky Squire — Small version famous Sky Squire I ch rudder-only, or rudder, elevator and motor on Galloping Ghost. Only 22-25 oz **$2**

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No. [illegible]2, Rivets — Speedy, responsive R/C Owen Kampen design for .020 Adams Baby Actuator, rudder-only **$1.75**

No. 1183, Corrigan James Wilson's unique ½A C/L stunt model Flies tail first! Stable like Big stunt ships Easy to build, 27" **$1.75**

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No. A697, Dwarf Dip III — Easy to fly, rubber Coupe de Hiver by Charles Sotich, a winner! For small fields. Warp-resistant **$1.50**

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No. 0904, Antoinette — Signorino/Zundel RC. 98" wing, nearly scale. Flies well on 35, like powered glider Plans 3 huge detailed sheets. **$9.00**

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[redacted]. 0212, Voodoo—Converted Goldberg kit for streamer-towing RC combat, by Ed Sweeney. Two servos with 19 engine. For [redacted] event. $2.75

[redacted]. 0213, Guillotine—Modified from CL for RC combat. Maneuverable, fast, responsive, and fun. Glides well. For two servos and [redacted] engine. For new event. $2.75.

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idea, since the beginners are being judged fairly by proficient contest fliers. It also cuts the manpower requirements of the sponsoring organization. All Pattern fliers had four flights, using a shortened pattern for A and B and the standard pattern for D. All A and B fliers flew fixed landing gear. Several Class D fliers, including Jim Whitley, Rod Chidgey, Norm Page and Lou Penrod, flew retracts. I flew a fixed-gear Phoenix which was well-trimmed.

Scale competition was tight all the way, with H. Vandiver and his No. 19 SE-5 biplane edging out Frank Nosen's rocket-firing P-47 (second place Nats winner). As an interesting sidelight of the Scale competition, Joe Boudwin, who flew SE-5's and No. 19 in particular during WW I, discussed the ship's flying characteristics and his personal experiences with it. He is now retired and lives in Florida.

Winners in all classes were: Formula I, Norman Page–Minnow (K&B 40); Open Pylon, Mike Barna–special design Mirage (K&B 40); Scale, H. J. Vandiver–SE-5 Biplane; Class A, Don Kollachek; Class B, Jim Hiller; and Class D, Don Lowe–Phoenix 5. Grand Champion was Jim Hiller, age 13, who won in Class B and placed in Open Pylon and Scale.

Most Outstanding Aircraft awards were as follows: Formula I, Bob Violett–midwing Cosmic Wind; Sport Pylon, Frank Madl–Pattern ship with retracts; Scale, Frank Nosen–P-47; and Pattern, Sterling Smith–midwing original.

On the Scene

(continued from page 18)

separation between the pylon course and the spectators. In a number of instances, only luck prevented injury. Two automobiles plus the control tower were hit, but fast action by spectators averted other accidents. Bob Violett feels strongly that some sort of barrier is needed at all racing events–or at least more physical separation. AMA's revised rules for 1971 require 100 ft. more separation between spectators and the pylon course.

Bob's beautiful midwing Cosmic Wind met an untimely demise when, because of mechanical failure, it hit a car. Barriers cost money. How can clubs finance such things? Adequate separation isn't possible in some situations. What can be done? Let's not wait until someone is killed.

A and B Pattern events were flown first and judged by Class D fliers. This is a fine

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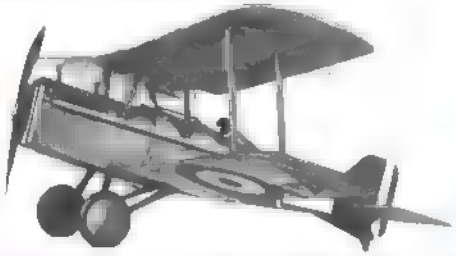
KWIK-FLI III . . . World and twice Nats. winner. Designed by Phil Kraft. Span: 60" Eng.: 45 to 61 Kit RC-12 **39.95**
Includes T.A.C.—Ready made wing fixture



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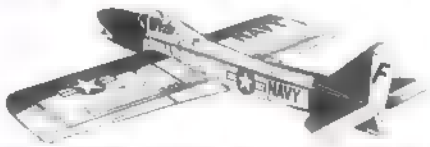

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R/C NOBLER—Radio version of the winningest stunt model of all time. Wing Span: 51" Eng.: .[illegible] to .45. Kit RC-14 **$29.95**

WINNER [illegible] THE 1962 NATIONALS

TAURUS . . . Span—70" Eng.-.45 Kit RC-7 **34.50**
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TAURI . . . NOW includes ailerons [illegible] fittings. Multi channel trainer. Span-57" Eng.-.15-.45 Kit RC-4 **23.95**

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Span-29" Eng.-.010-.020 Kit RC-3 **4.95**

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Span-19¼" Eng.-.010-.020 Kit RC-5 **4.50**

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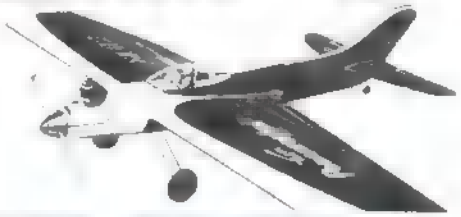

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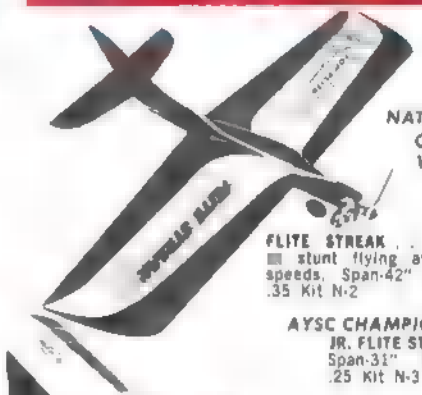

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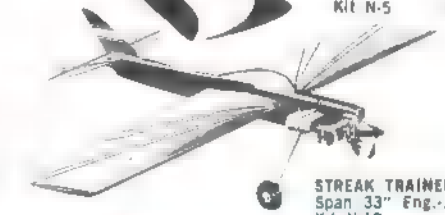

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TOP FLITE MODELS, INC. [illegible] S. WABASH CHICAGO [illegible], IL.

Blue Ribbon Review

(continued from page 52)

care must be taken to follow the manufacturer's instructions for wheel attachment to prevent slippage. If the car turns right or left under power or with the brakes on hard, check wheel attachment. The rear wheels are held on the axle with clamps which are part of the wheel. The axle is sandblasted in the right places to make attachment positive. The front axle stubs and the clutch also are held with clamps. When set up properly, this attachment method holds reliably.

The car was tested with a well-broken-in Webra 20 and the Curtis-supplied heat sink. A fuel filter was added, along with an intake filter. The flywheel supplied with the kit has 1/4-28 threads but Curtis will supply, through dealers, flywheels with threads for some foreign engines now legal under the 1971 ROAR rules.

To evaluate the Curtis steering/servo protection system, the car was driven with a more conventional radio prior to installing the Kraft "brick." The system was simple, straightforward, and worked well. However, as explained below, our radio choice required a different system.

The Kraft Series Seventy-One two-channel radio makes a neat radio installation. Because of the combined receiver/servos "brick," a tiller arrangement was constructed for the steering. A brass can with a tube on the forward end was constructed to hold the brick. The tiller, made of music wire, pivots in this tube. A slotted ear was soldered on the Curtis tierod to fit over the tiller. This steering arrangement provides servo protection and, by using the adjustments on the servo output, the steering ratio can be adjusted.

For testing, an RC car is run on various surfaces under various conditions to determine the car's reliability and handling characteristics and to evaluate the car's unique features. The car is run around a 20-ft. radius circle, an oval, and a road course. The 20-ft. radius circle is run in both directions to determine the basic handling characteristics of the car. These circle runs will reveal the amount of understeer or oversteer and give a good idea of how the car behaves when pushed to the very limit of adhesion.

Sessions on an oval will show what driving technique is required for maximum performance. The road course is run with other cars to evaluate the competition potential of the car. The car is tested with all adjustments as recommended by the manufacturer. Changes made during the testing period will be discussed only if these departures yield significantly improved performance.

The first testing session after the axle change left two distinct impressions. First, this car is fast and its road holding excellent. Second, the combination of good adhesion and an effective brake demands a lot of skill to drive this car to its limit. It took an entire testing session of going into corners deeper and deeper to approach the limit with this car.

The sessions around the 20-ft. circle to the right and left showed very slight understeer and no noticeable bounce. The car can be

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9"	8-8½-9	90¢
9½"	8-8½-9	90¢

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9"	6	75¢
10"	6	80¢
11"	6-7-8	85¢
12"	6	95¢
14"	6	$1.25

POWER PROPS

11"	6-7-7½-8	85¢

NYLON PROPS

DIAM.	PITCH	PRICE
5¼"	3-4	30¢
6"	3-4	35¢
7"	4-6	50¢
8"	4-6	65¢
9"	4-6-7	85¢
10"	3½-6	85¢
11"	4-6-7-8	$1.00
12"	6	$1.50

POWER PROPS

5¼"	3-4	30¢
6"	3-4	30¢
7"	4-6	40¢
8"	4-5-6	45¢
9"	6-8	50¢
10"	6-8	55¢
11"	4-6-8	65¢
12"	4-5-6-8	70¢

TOP FLITES

[illegible]	PITCH	[illegible]
6"	3-4-5	30¢
7"	3-4-6	40¢
8"	3½-5-6-8	45¢
9"	4-5-6-7-8	50¢
10"	3½-5-6-8	55¢
11"	4-5-6-7¼-8-8¼	65¢
12"	4-5-6-8	70¢
13"	5½	80¢
14"	4-6	90¢

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held on the circle easily, right to the point of spin-out. The combination of a low polar moment of inertia and the tire composition results in a sudden spin. There is very little warning prior to spinning and, when the tire slip angles reach the point of loss of traction, the car spins like a top. However, this must be put in context. The speed required to reach these conditions is high, higher than some RC cars reach. With a little practice, the driver can easily stay this side of the ragged edge with this car and produce some startling lap times.

A short session on oval course indicated the car will perform best when driven very deep into the corner, braking while still in a straight line and cornering under power and holding the line. This results in the largest radius, rather than the shortest distance.

A long spell of cold weather did not permit the desired extent of road course testing. Short sessions with contemporary cars did leave the impression that this car, with a good strong engine, will be hard to beat. The races that were run were short (who can drive very long with temperatures well below freezing and a strong wind blowing?) but clearly showed that this car is competitive.

The car is easy to maintain, it just doesn't have that many parts. After each session, a good washdown is about all that is required. It is also a good idea to check the motor mounts, since they were the only thing found that did loosen up during the testing. This car is for drivers, not for people who like to tinker with a machine. At a sedate pace the car is docile, so it can be driven by a beginner. In the hands of an experienced driver, it is pure racing car.

Some comments are in order, but may not apply to later cars because of constant improvements made by Curtis. Our car did not have a really convenient way to mount a muffler if local rules or driving locations should so dicate. At full throttle with a competition engine, this car with the built-in exhaust manifold is noisy. The composition of the layers of foam used in the tires should be checked. Ours was delivered with some layers softer than others, which resulted in uneven wear of the front tires and would eventually cause some handling problems.

The car is not built like a tank and is more susceptible to damage in a bad pile-up than some production cars, but it is not fragile. Besides, whoever heard of a tank winning an automobile race?

The Kraft Series 71 KP-2B

The Kraft KP-2B represents somewhat of a breakthrough in digital systems in that it is a complete two-channel system ready to operate for $99.95. However, it has some limitations which are a concession to price. This system is designed for operation in cars, boats, or aircraft. Our primary tests were performed in a car, but the system also was test flown briefly in a plane.

The system has two major physical features. The transmitter has two single axis sticks: the one on the right side is for azimuth control (rudder, steering, etc.) and the other is for longitudinal control (throttle/brakes or elevator). The other feature is the use of a "brick" airborne pack, i.e., all the receiver, decoder, servo electronics, and servomechanisms are enclosed in a single unit. Only the battery pack and switch are external to the brick.

Electronically, the system has made only one concession to price. Dry cells are used for both the transmitter and receiver. The transmitter accepts a single 9V battery (an Eveready No. 276 was purchased for use with the set) and four Alkaline Energizers are needed for the airborne pack. It must be emphasized that only Alkaline Energizers should be used with any RC system, not the ordinary carbon-zinc cells. Also, beware of dry cells which have a false bottom, i.e., a small shiny disk which contacts the bottom of the cell and is held only by the paper wrapping. On these, use a sharp knife to cut the paper and remove the disk. If this is not done, vibration problems may be encountered.

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Kit GDA-57-1, transmitter, battery, charging cord, (specify freq. desired), 5 lbs. **54.95***

Kit GDA-57-2, receiver only (specify freq. desired), 3 lbs. **34.95***

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first heard on a monitor. The frame rate is nominally about 330 frames per second, or 3.0 milliseconds, and the repetition rate appears to change markedly with control movement. And it does. Control pulses are not provided by a series of half-shot multis.

Instead, a unique approach works as follows. A free running multivibrator ■ set to operate at a nominal 330 frames per second. This gives ■ repetition time of 1 divided by 330 or 3.0 milliseconds. The multivibrator output wave is symmetrical for neutral control conditions: that is, it is on for 1.5 milliseconds and off for a like period. However, each half of the frame can be varied independently of the other half to provide a variance of plus and minus 0.5 milliseconds in on time and off time.

These two periods, 1.5 ± 0.5 milliseconds, will immediately be recognized as the usual control pulse widths for almost all digital servos. When both controls are moved to the extreme using 1.0 millisecond pulses (up elevator and left rudder), the repetition rate is the inverse of 2 milliseconds or 500 frames per second. Conversely, at full total width of 4.0 milliseconds, the frame rate is 250 per second. This means that the servos receive information at a much more rapid rate than the usual 30 or so frames per second. It also simplifies encoder design.

However, the system is limited in that it cannot be expanded beyond the two channels in usual digital fashion. The positive and negative going edges of the multivibrator output are differentiated to provide two modulation pulses per frame and there is no need for a synchronization pause.

Decoding is provided by a flip-flop which simply changes state each time a pulse is received. Remember that a flip-flop always has two outputs, Q and $\overline{Q}$, and that one is always the opposite polarity from the other, i.e., when Q is nominally 6.0V, $\overline{Q}$ is 0V and vice versa, and the decoding operation becomes simple. When the first pulse representing frame start is received, Q becomes positive, $\overline{Q}$ becomes negative. At the second pulse, Q becomes negative and Q becomes positive. Since these two times also correspond to the original encoder output periods, they become independently decoded positive control pulses of 1.5 ± 0.5 milliseconds.

These pulses are then routed to two servoamplifiers driving essentially KPS-12 servomechanisms. Each of these consists of a two-transistor one-shot multivibrator reference pulse generator whose pulse duration is set by the feedback potentiometer. A resistor network is used to compare the length of the input and reference pulses and to provide error pulses to ■ two-transistor pulse stretcher in each leg (clockwise of CCW) of the servo drive stage.

All discrete components are used throughout the system. Because of the use of a brick-type airborne pack, extreme compactness of the electronics is unnecessary. Changeable crystals were not used in the test set, however, the frequency change feature is available as an option at extra cost.

The transmitter is housed in a vinyl-clad aluminum case 5 3/4 x 5 1/4 x 2 1/4". No meter is provided. A base-loaded antenna is used. The receiver, decoder, servo amplifiers and servomechanisms are housed in a plastic case which measures 3 5/8" long, including mounting lugs, by 1 21/32" wide by 1 9/16" high, including the servo output arms. The

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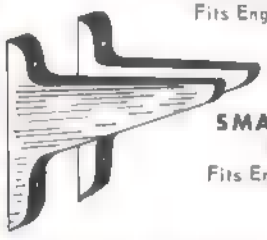

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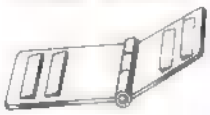

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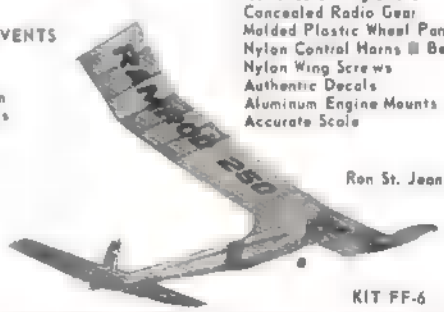

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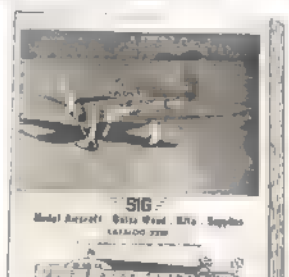

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battery pack is 1 3/8 x 1 3/8 x 2 3/8". Total weight of the airborne unit is slightly less than nine oz.

Bench tests consisted of physical inspection, tracing and evaluation of waveforms with an oscilloscope, temperature stability tests, and determination of servo output thrust. The system performed quite well in all respects. I was particularly concerned about the temperature stability of the free-running multivibrator used for encoding. This stems from experience several years back in which many people tried to use multis for pulse applications with generally poor results. However, this concern proved to be unfounded because of the application of silicon transistors and precision mylar capacitors. The system was cold-soaked overnight at 0 degrees F and, while the servos were measurably slower, there was no drift in trim.

The system was then brought to 150 degrees F and retested. Approximately 10 per cent drift in trim neutral was encountered, certainly not a significant amount.

Servo thrust is approximately 2.5 lb. and end-to-end transit time is 0.6 sec. which is equal to that for a KPS-12 servo.

Preliminary tests were performed in a Mod Pod (a powered glider which appeared in the May 1970 AAM). The airborne unit fits the equipment bay without forcing. The test set performed flawlessly, however, it appears that the Mod Pod requires a rather healthy .049 engine for meaningful performance.

The test set was then installed in the Curtis car and these tests are reported here by Wendel Green.

In summary, the KP-2B is a clever new

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approach to providing a low-cost system with big-system reliability for gliders, cars, boats, and two-function power planes. It is limited to two channels. Quality, in general, is excellent. Only two minor criticisms can be made. Two of the retaining screws for the top of the airborne "brick" were too short and did not engage the bosses provided in the bottom case. This was a simple assembly error readily corrected. The decoder/servo amplifier b oard has a relief cut in on each side to clear the two bosses mentioned above. The amount of PC board removed caused the PC land carrying + 6.0 volts to the servo amp to be very nearly severed. A slight correction in PC layout should take care of this.

Editor's Note: This review was completed in mid-January. A few weeks later, while attending the Chicago Toy and Hobby Show of the Hobby Industry Association of America, we discovered that Curtis had made several interesting improvements in their car. Some of these changes resulted from our review, but the majority were developed by the Schnell and Ballenger racing team. These avid and successful RC racing enthusiasts recommened a machined aluminum engine mount which cradles the crankcase and front engine bearing, an engine-mounted exhaust collector to exit at the side of the chassis and body, a much softer-acting independent front suspension, and a dam to stop fuel and residue from creeping into the radio compartment. Also, the multiple-layer foam tires were replaced by a composition tire consisting of a molded foam center and a soft, solid rubber cap. The effect is like having a pneumatic tire. These all seem to be excellent improvements, but none have been evaluated in this review.

Platypus

(continued from page 21)

Next, glue the 3/8" diagonal balsa strips to the upper and lower edge of each side. Allow a 1/4" space at the front for plywood F3 and 1/8" for the plywood base. After the glue has dried, epoxy the plywood base and F3 in place. These parts must be cut accurately and aligned carefully to ensure a square fuselage. The 1/8" plywood base extends beyond the angle of the fuselage but is beveled later. Allow the epoxy to cure before proceeding.

F4 is installed now. Do not get any glue in the area where it contacts F3, since this is part of the removable wing nacelle assembly. Taper the triangular strips at the tail end and complete joining the fuselage sides by installing the formers. Keep the alignment straight.

Install the 1/4" balsa base and the rear ply former of the nacelle, the 3/4" balsa fuselage top, and the balsa nacelle block. Also add the 1/8" balsa sides of the nacelle. Do not glue the fuselage bottom. Carve and sand the top of the fuselage and nacelle block to shape.

Cut out the wing opening, using the 1/16" plywood fuselage doubler as a pattern. Make the diagonal cut in the doubler as a guide, make a similar cut at the trailing edge. Use a Zona saw to cut between F3 and F4 and along the parting line to the wing leading edge. Remove the nacelle to attach the wing.

Install pushrods or Nyrods in the fuselage. The 1/16" cross-grain balsa bottom is glued on after beveling the 1/8" ply bottom at the step area. Using contact cement, cover the bottom with Marvelite.

Make the cutout in the hull, using F2 as the pattern. Accuracy is essential that the step lines up properly when the fuselage is attached. The bottom of the cutout must be perpendicular to F2, to assure proper alignment of the hull and fuselage. Use plenty of epoxy to glue the fuselage into the hull. The basic fuselage is now complete except for the windshield, which is installed after the plane is painted.

Wing: Make templates from the rib outline on the plan and use standard hot wire cutting techniques to cut the wing from a two-in. thick foam slab. I used blue foam, cored for lightness. Beaded white foam does not require coring.

For covering, join two sheets of 12-in. wide, 1/16" balsa and do the wing in one operation. There is no leading edge. Use plenty of contact cement on both foam and the balsa sheeting. Wet the outside of the balsa at the leading edge and it will go around the foam wing without any trouble.

Square off the trailing edge and attach the 1/4 x 1/2" strip. After the glue sets, bevel and sand to the wing contour. Prop the two wing halves at the correct dihedral and join with epoxy. If the wing was cored, reinsert the cores at the center section before joining.

Bend the 3/32" music wire aileron control horns with the brass tubing on them and install with the hardwood trailing edge center section. Also install the hardwood leading edge insert. Six-inch wide fiberglass is applied all around the center section.

Before attaching the wing to the nacelle section, fill in the area between F4 and the wing leading edge, then shape it to the leading

edge contour. For a good fit, also shape the nacelle section where the top of the wing contacts it. Line up the nacelle with the center of the wing, and epoxy the wing and nacelle together.

Put the wing on the plane and locate and drill holes for the 1/4" hold-down dowels, which are glued in place. Maple blocks for the 1/4-20 nylon hold-down bolt are installed and tapped for the bolt.

Finish the nacelle by installing the 1/16" balsa doublers, the 3/8" diagonal corner braces, and the Tatone engine mount. Drill holes for the throttle, fuel line and tank air vent. The nacelle hatch cover is made from balsa blocks.

The wing is completed by attaching the wing tips and ailerons. Make the [illegible] cutout and line [illegible] with plywood. The throttle cable is run from the engine through the firewall, to the bottom of the nacelle and the wing, to the servo in the wing.

Rudder and Stabilizer: The vertical fin and rudder are 1/4" sheet balsa. To cover the original stab I used .007" Mylar film, but it [illegible] difficult to glue to the foam. The plans now show 1/16" balsa sheeting. A 1/4" sheet stab probably would work as well. Elevators are made from 1/4" sheet balsa joined at the center with [illegible] hardwood insert. Glue the stab to the fuselage at zero degrees incidence. Check alignment and then attach the vertical fin.

Tip Floats: Wing tip floats and the secondary step are cut from styrofoam. To keep the weight down, use only two coats of Hobbypoxy II. For a smooth finish, apply saran wrap or the backing release film from

MonoKote over the wet epoxy. It is peeled off after curing. Do this for the second coat only. The hull step then is epoxied to the fuselage and painted with the rest of the plane. Glue tip floats to the wing with contact cement.

Finishing: Carve and sand to shape. Fill any areas or cracks which might allow water to enter the fuselage. Then use MonoKote on the wing and stab and Hobbypoxy on the rest of the plane. Do not seal or dope areas to be covered with MonoKote because this will interfere with its sticking. Give the hull, fuselage, nacelle and rudder three coats of dope, sanding between coats. Then cover the fuselage and rudder with lightweight Silkspan. It is not necessary to paper the bottom of the fuselage, which already is covered with Marvelite. The cowl, nacelle and center section are covered with Silron for extra strength.

Apply three more coats of dope, sanding between coats. Then paint with Hobbypoxy, which will adhere well to the dope if the areas to be painted are washed with alcohol. This removes the plasticizer from the dope's surface and allows the epoxy to get a better bite. The edges of the MonoKote should be sealed with clear epoxy to ensure a watertight seal. The wing seat must be well sealed. I used RTV, but soft rubber tubing, or even window caulking, will work.

If pushrods are used, they must be sealed at the tail where they come through the fuselage. I made a rubber sleeve which fits over the end of the pushrod and is cemented to the fuselage with rubber cement. It is attached to the Kwik-Link by wrapping a

small rubber band around it. A small section of balloon can be used for a sleeve, but allow for pushrod movement by leaving some slack.

Flying: The CG should be approximately one half in. behind the step (see plan). All surfaces must be working freely and in the right direction. Range-check the equipment and the Platypus is ready to go.

The original ship has excellent water handling characteristics, so don't worry if the model looks as though it has sunk. That's normal. The stab sits almost on the surface and the wing isn't much further out of the water.

Taxi the ship around to get the feel of it. Then aim it into the wind and open the throttle. It may be necessary to hold a little right rudder until it gets up on the step but, once it is up, a touch of elevator and it lifts off. This is one seaplane that takes off like an airplane, without fuss or spray.

In the air, it is groovy and quite fast. The first few flights should be made at reduced throttle, since the Platypus will do the pattern at half throttle. Although it does knife-edge flight, reverse spins, inverted spins and snap rolls, the plane has no vicious traits. It can be flown at very slow speed without falling off.

Landing can be a problem, because the model is a very clean and will glide forever if speed is allowed to build up on the final approach, then flaired out. It won't come down! The best approach is to keep the nose up and the speed down with the engine at low idle. Keep the wings level, fly right down to the water and it will land itself.

Taxiing is no problem although the ship may take off if taxied too fast. I have had it lift off at less than half throttle. Because the Platypus is so close to the water it is not bothered very much by the wind. I have had no problems taxiing either crosswind or downwind. I have also taken off and landed crosswind without difficulty.

Tailup

(continued from page 44)

paper under the joint will prevent the wing from sticking to the board.

Elevators are fitted as shown in the wing construction sketches. Round off all edges with sandpaper and give the wings two coats of dope, following the same procedure as for the fin. Two layers of tissue doped over the center of the wing on the underside reinforce the center section. Repeat this method for front elevator, using dihedral jigs(y).

Ballpoint pen lines can be drawn on the wing and elevator, and the insignia (ours is that of the Swedish Royal Air Force) can be painted directly on the model, or painted on thin paper, cut out and glued in position. Wing and front elevator are then slipped through their respective slots, checked by viewing from the front for equal dihedral and firmly cemented in place.

Make up the test motor (see plan), lubricate with rubber lube, and install it in the model. Balancing is important. Many beginners, and old hands too, so often neglect this all-important item before flight testing. Suspend the model from a thread tied to a pin which is pushed into the balance point shown on the plan (black arrow). Put a little weight (sheet lead or folded empty cement tube) into the recess provided in the nose cone until the model hangs level. The ship should not hang with one wing down (front view). If it does, add a tiny spot of plasticine or modeling clay

to the top of the lighter wing.

Choose a calm day for flying and test over long grass. Without winding the motor, launch the model into the breeze, from shoulder height, with a smooth follow-through movement of the arm. Never throw the model. It should glide down straight ahead and land about 15 to 20 yd. away. To get a really shallow glide, bend the elevators on the wing tips up a wee bit (about 1/16"). Correct a sharp turn in either direction by gently warping the rear part of the fin in the direction opposite to the turn. Now it is ready for a power flight.

Wind the propeller in a counterclockwise direction and put on about 200 to 250 turns. The model should climb away gently from a smooth follow-through launch, cruise a short distance and glide in to a smooth landing. If the model dives, put a piece of 1/16" sq. balsa strip between the bottom of the prop block and the fuselage, or bend the elevators up a little more. If the model stalls (climbs steeply, falls backwards, and then nosedives) put a piece of 1/16" sq. balsa strip between the top of the prop block and the fuselage. When the model is making short but steady flights, install the larger motor, which will take about 700 turns on run-in lubricated rubber.

Getting Started in RC

(continued from page 49)

Some years ago, nylon props were considered quite safe (except for those which were nicked or cracked) and prop blades were seldom thrown. However, engine power and rpms have increased greatly and on the larger engines it's best to use only hard maple propellers. Even the usual wood types may not stand the strain. Cold weather makes most materials brittle. Plastics generally are poor in this respect, so in cold weather be even more wary of nylon props on powerful large engines.

One maker strongly recommends that every one of his nylon props be immersed in boiling water for at least 15 minutes. The

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nylon molding process requires high heat, and moisture is driven out of the plastic, making it brittle. The props will slowly absorb atmospheric moisture, but this takes many months, while boiling does the job quickly. After boiling, add cold water slowly to cool down the prop without causing warpage. Dyes can be added to the water to color the props. Some prop makers do not feel boiling does much good, but none have said it does any harm—so better boil these props, regardless of make. (See AAM editoral, p. 34, August 1969.)

Unbalanced props also have a serious effect on the model's electronics. Vibration shakes all control system components violently, leading to broken wires, ruined parts, etc. It also shakes all linkage and metal parts of the model, producing electrical interference which may reduce control range or even render the system inoperative. A few minutes of prop balancing will prevent such problems.

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To be read with deep feeling, breaking into sobs on the concluding lines . . . .

I was up in the dawn's early breaking,
All the birds still asleep in the trees,
So I packed up my gear and got started
With a morning to do as I pleased.

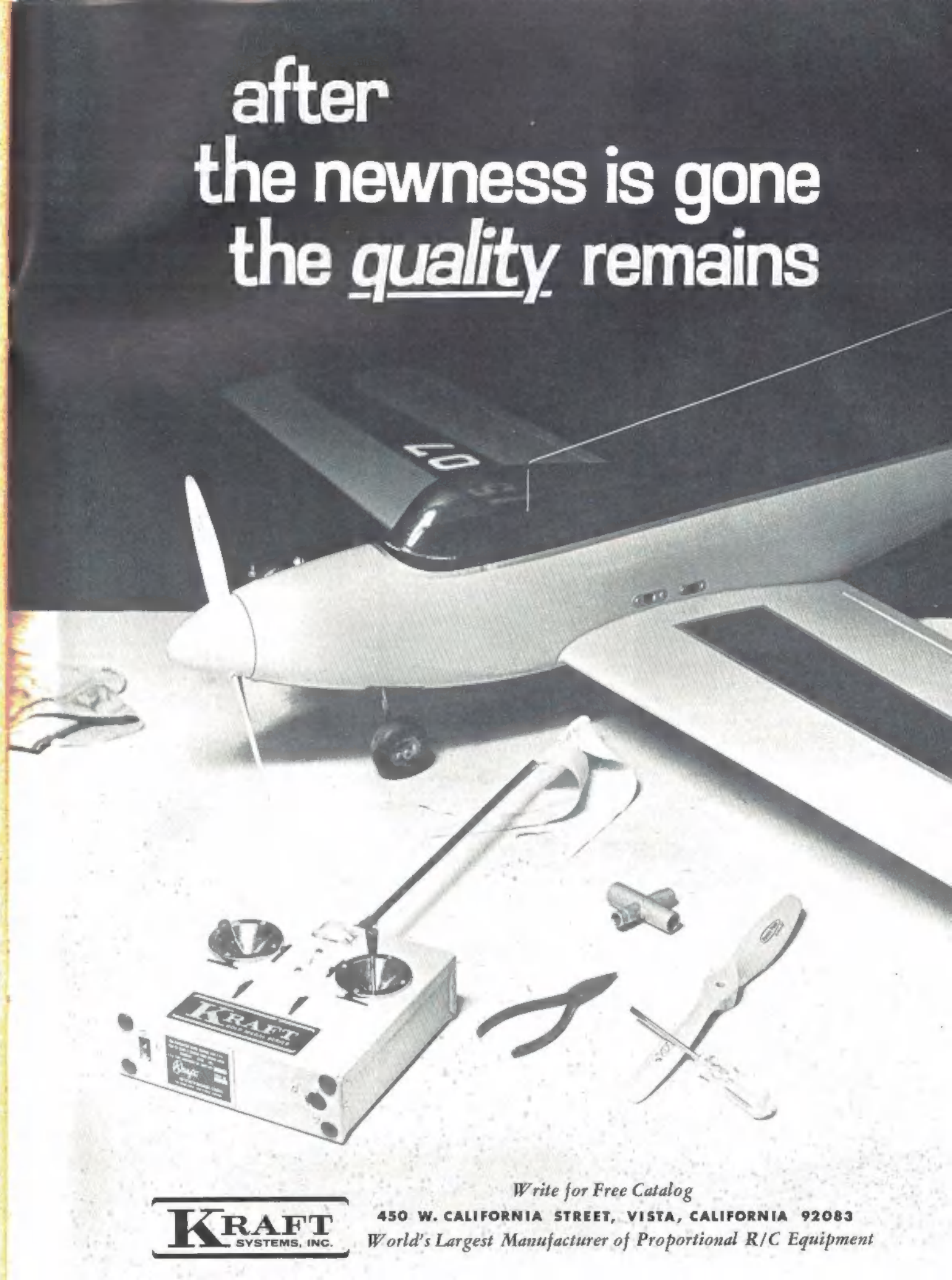
Forty miles of roadway I traveled,
On a breakfast of cornflakes and tea,
But I thought with a thrill of the hours
With nobody flying but me.

Only two other guys shared the field,
Both had frequencies different from mine.
I unloaded the car in a frenzy,
For this was my moment to shine.

I was gassed up and ready for take-off,
When I found, with a sickening wrench,
That my glorious chance was all over,
'Cause my transmitter's home on the bench.

Natalie King

after the newness is gone the *quality* remains



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